99'er HOME COMPUTER magazine

COVERING THE TEXAS INSTRUMENTS BRAND OF HOME COMPUTERS

August, 1983 $3.50 in U.S.A.

The Compact Computer Comes Home

Low-Cost Printer & Word Processing Software

LOGO Talks Turtle

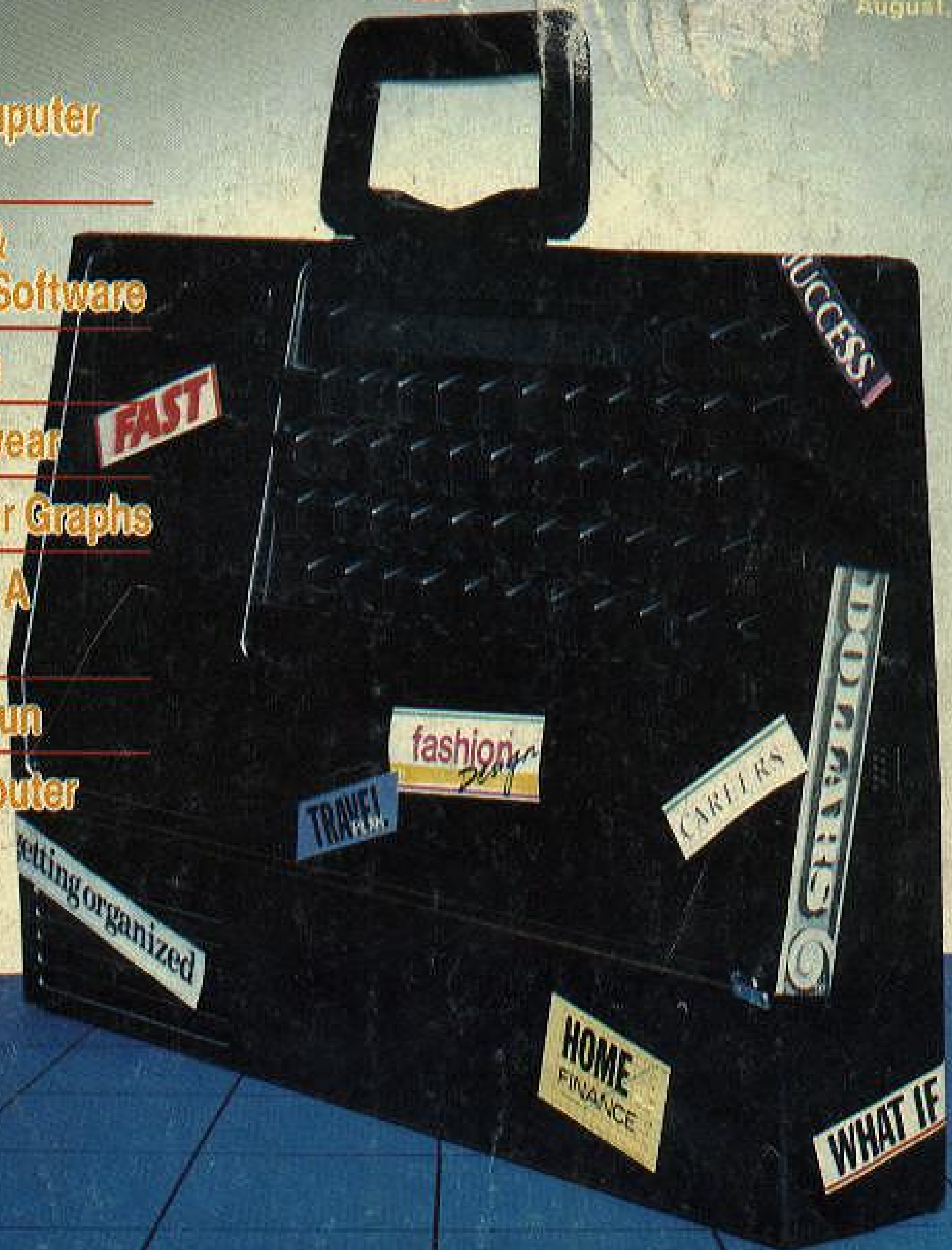
Software for Knitwear

Better Business Bar Graphs

PLATO: Surveying A Learning Library

Survival Gaming Fun

Cashflow by Computer


SUCCESS
FAST
DOLLARS & SENSE
fashion design
CAREERS
TRAVEL
getting organized
HOME FINANCE
WHAT IF

The Home Computer Goes t

45894G00CP0 80 MAY86 H111160799
CHARLES GOOD
PO BOX 647
VENEDOCIA OH 45894

State ______ Zip ______

ltracomp Systems

Ultracomp Systems
1001 Ogden Avenue #5
Downers Grove IL 60515-9228

THE SECRETS OF PERFECT MEMORY:
ONE EARTH DOLLAR

AT LAST: THE WHOLE TRUTH ABOUT FLOPPIES.

Amazing book reveals all!

How to keep from brainwashing your disk so it never loses it's memory.

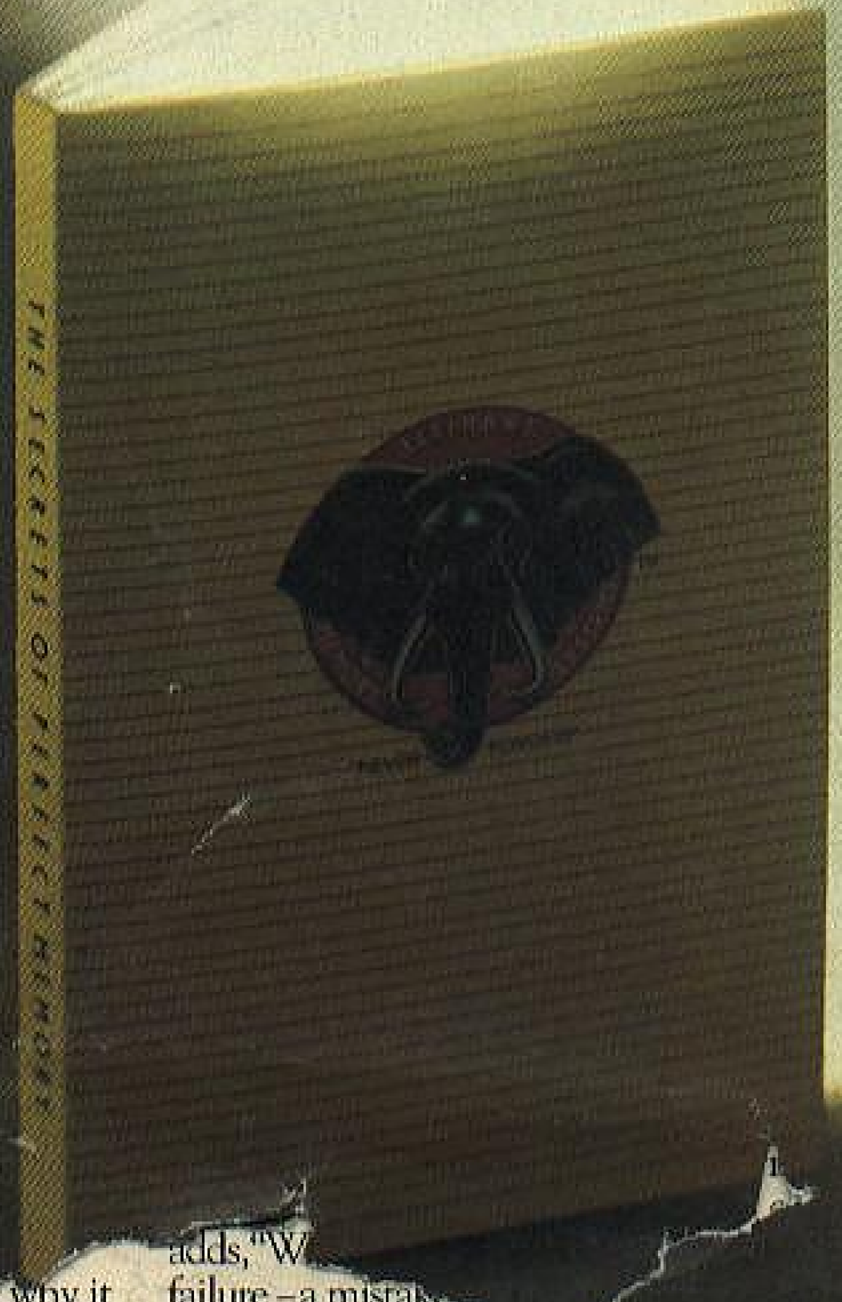
How fingerprints can actually damage disks. Unretouched Kirlian photographs of UFO's (Unidentified Floppy Objects)! The incredible importance of making copies: the Department of Redundancy Department—and what goes on when it goes on! Powerful secret methods that scientists claim can actually prevent computer amnesia! All this, and much more . . .

In short, it's an 80-page plain-English, graphically stunning, pocket-sized definitive guide to the care and feeding of flexible disks.

For The Book, ask your nearest computer store that sells Elephant™ disks, and bring along a buck.

For the name of the store, ask us.

ELEPHANT MEMORY SYSTEMS® Marketed exclusively by Leading Edge Products, Inc., Education Systems Division



LOGO, a
developed by

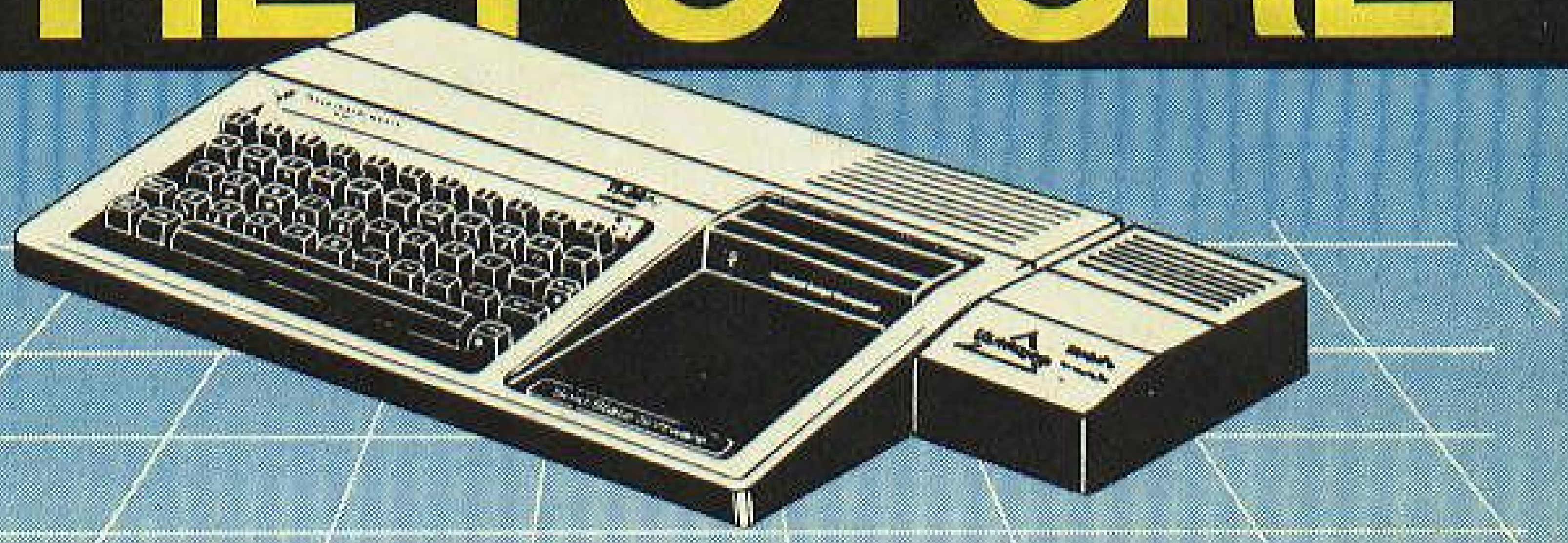
In his inner-city,
junior high classroom,
Steve Siegelbaum explains why it works so well.

"When they use it, they think they're teaching the machine. In reality, it's teaching them how to

adds, "W
failure – a mistake
ing point. The whole
process turns into a posit
rience. It works."

The TI Learning C

EXPAND INTO THE FUTURE



with cost-effective, versatile Ultra-Modules® from Ultracomp Systems

All Modules Feature

- Shielded connector design for RFI/EMI integrity
- Stand alone compatibility with the computer's built-in connector without extra cables
- Durable and attractive enclosure
- State of the art design and reliability
- Easy to use installation/operation manual
- 90 day limited warranty

Currently Available Ultra-Ram Modules

- 16K x 8 Ram memory expansion
- 32K X 8 Ram memory expansion

Currently Available Ultra-Smart Ram Modules

- CMOS memory design available in 8K, 16K, and 32K X 8 configurations (battery included)
- Non-Volatile storage of data and/or programs
- Battery life designed for 1-2 yrs. min. under normal storage and operating conditions
- Low battery indication and easy replacement without loss of memory

Order toll free:

1-800-528-6050 ask for ext. **#1216**

Arizona — 1-800-352-0458.

Delivery 2-4 weeks

VISA

MasterCard

New Products available soon

- User Programmable Modules
- Ultra-Bus® Expansion System and
- MINI-MOD Expansion Modules
- Ultra-Modules® for the TI peripheral expansion box
- RS-232 Systems

Ultra-RAM Modules

☐ 16K x 8 $ 99.95

☐ 32K x 8 $149.95

☐ Send Descriptive technical Brochure of Ultra-Module® family

Ultra-Smart RAM Modules

☐ 8K x 8 $119.95

☐ 16K x 8 $169.95

☐ 32K x 8 $269.95

Specify: Black ☐ Tan ☐ case

Illinois deliveries add 6% sales tax.

Please add $5.00 for postage for each item ordered.

☐ Check or M.O. enclosed.

Charge to: VISA ☐ MASTER CARD ☐

Expiration date Account Number

Signature ______

Name ______

Address ______

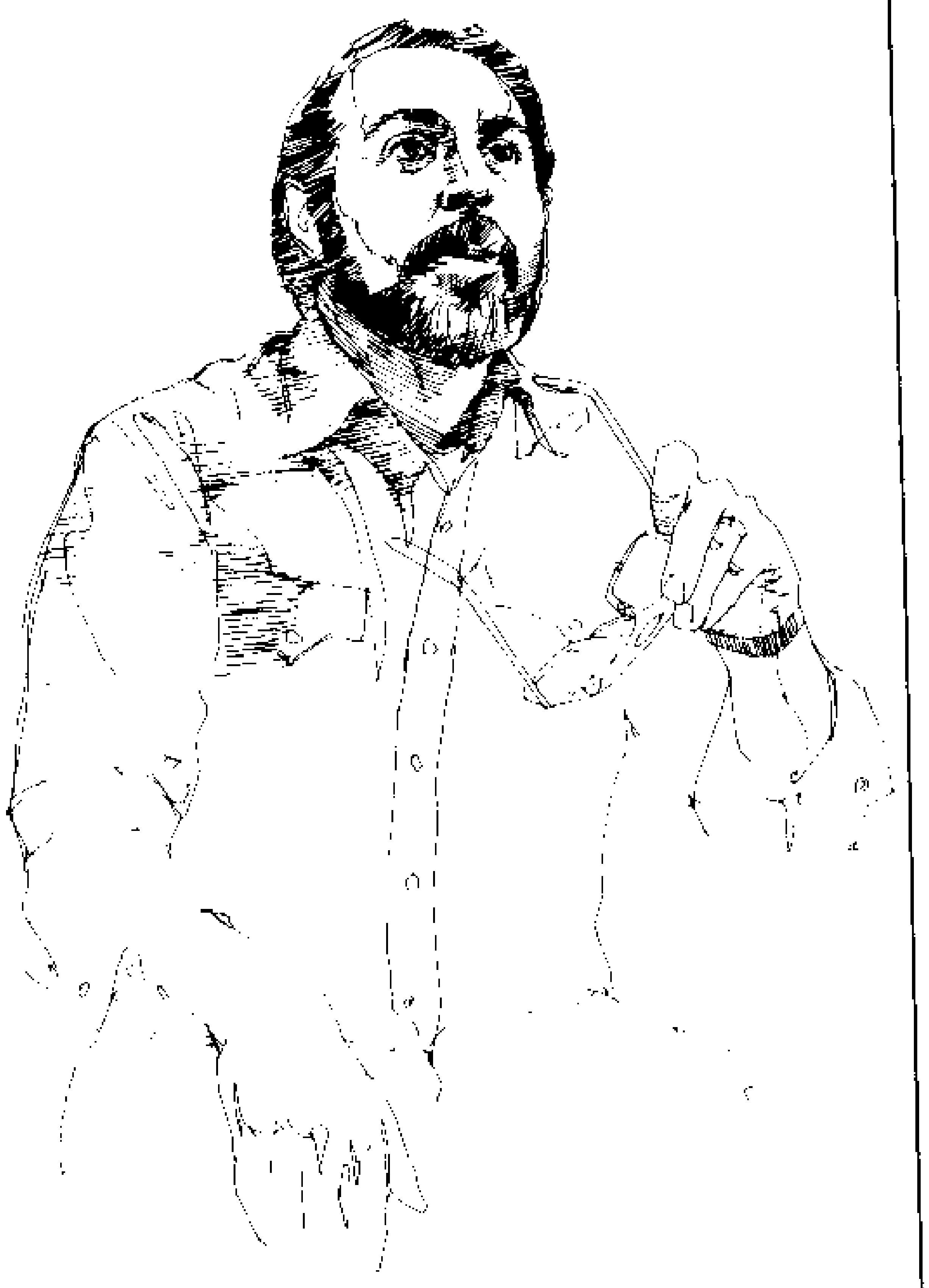
City ______ State ______ Zip ______

Ultracomp Systems

Ultracomp Systems
1001 Ogden Avenue #5
Downers Grove IL 60515-9228

ON SCREEN

By Gary M. Kaplan
Publisher & Editor-in-Chief



"Rapid growth can sometimes be a disaster in disguise."

"The price of convenience is conformity."
—Walter Hego

This month's issue is our largest to date. Editorial and advertising content have been increasing steadily in equal proportions to give you that "fatter" magazine I promised a while back. I want to thank you, our readers, for making this possible; your response to our advertisers and your help in getting new subscribers and magazine sellers has been invaluable in bringing us this far. We still have a long way to go before you can heft a monthly 300-page issue, but that isn't as remote as some might think.

As we mature as a communications vehicle, we feel we should strive for more lofty goals in two crucial areas: customer service and innovation. Rapid growth can sometimes be a disaster in disguise—on the surface it struts proudly, exhibiting its impressive new suit of clothes; but underneath this superficial costume nothing has really improved . . .

Fortunately, our editorial, production, advertising, and circulation/fulfillment staffs take great pride in what they do, and they constantly strive to improve their individual levels of efficiency and creativity. You readers benefit from this in at least two ways: (1) Faster in-house production of the magazine now allows shipment from a more central geographic location—a change that will ensure earlier delivery for subscribers and magazine sellers alike; (2) More innovative features will keep *99'er HCM* from falling into that rut of boring, institutionalized conformity that so many computer publications have plodded into for the sake of convenience.

I also hope that you, our readers, will keep us on our toes. Whenever we do something well—or not so well—please tell us. Send us your ideas for new features and for improvements to existing ones. And by all means, keep your manuscripts and programs coming. We'll need more and more material as we continue to grow.

And we'll need new kinds of material. We're going to start featuring, for instance, works of "technological fiction." I've purposely avoided the more familiar term, "science fiction," because we've been conditioned to accept preconceived limitations in the scope of this genre. We're presently searching for unique short stories of high literary merit that are centered around computers, robotics, and associated technology.

And you accomplished programmers will want to get a head start on preparing your submissions for next month's announcement of our spectacular Home Computer Animation Contest. At this point, suffice it to say that we'll be looking for visually-attractive, non-repetitive sequences of a few minutes' duration. Animated scenes should demonstrate some random branching ingenuity to drive the projection loop.

To the "shutter bugs" among you, we'll be making cash awards for the best color photos demonstrating the educational use of the Texas Instruments Home Computer in the classroom. And if some "snap happy" members of users groups should happen to send photos of interesting (or unusual) group activities to spice up our "Group Grapevine" feature, we'll promise not to let any negative thoughts flash into our minds, frame our objectivity, filter out your creativity, or crop the best expression of your photographic masterpiece. With any luck, it might even see the light of print . . .

99'er HOME COMPUTER magazine

Hayder Amir's portrait of the TI-99/4A Home Computer may present a surprising image to those who thought that entertainment, education, and home management were the only paths along which this bold little console dared to tread. The travel stickers, which represent the 99/4A's most recent journeys through the World of Work, are evidence of what creative programming can do to transform a laid-back homebody into a decisive executive. The only problem now may be: How are we going to keep this computer "down on the homestead after it's seen Wall Street?"

CONTENTS

August, 1983 Vol. 2, No. 10

8. Bit One, Purl Two
By Pat Olsen
The 99/4A turns Designer Computer to create custom knitware.

9. Graphic Persuasion
By Fred Ellis
Bar graphs are beautiful and good for business.

14. An Ensemble of Assemblers
By Patricia Swift
A comparison of 3 assemblers for Mini Memory.

26. Cashflow
By Joel Moskowitz
Where has all the money gone?

22. Keystrokes for Thrifty Folks
By Walter Hego
A Review of Typwriter—a low cost word processor.

Computer Gaming

29

Cavern Quest: A Review
By Greg Roberts
Over the beasties and through the caverns—beware of killer spiders!

30. Starprobe '99: A Review
By Erin O'Connor and Debby Amity
Can you survive the dangers hidden in this colorful labyrinth?

32. Gameware Buffet

32

Jungle Jim
By Michael McCue
Diamonds and monkeys abound in this perilous jungle game.

Money
PPINESS
FAME

33

Success Formula
By Oris Bud Davis
New careers for your chance at fame, wealth, and happiness.

34. Counting Fun
By Rolynda Brantley
A preschooler's delight complete with E.T.

41. Peripheral Vision 99
By Will Schick
Look into the capabilities of a compact new printer.

58. Mean Machines and Small Potatoes
By Greg Roberts
The misadventures of Dick Dren and Grandma Leathers.

64. Multiplan Medium
By Patricia Swift
Grouping cells into rectangular bunches makes a good plan even better.

LOGO Times

69

Turtle Text
By Roger Kirchner
LOGO as a word processing language—that's write!

Portable Computing

73. Hello, Little Brother
By Robert Ackerman
The humble Hex-bus helps the TI-99/4A and the CC-40 communicate.

Plato's Progress

76

A Classic Learning System
By Sharyn Lyon
The living library of learning comes home to assess student skills.

83. Pocket Sunrise
By S.T. Holl
Key it in and catch some colorful cathode rays!

86. Public Investigator
By Robert Hess
Create questionnaires and tally the results.

4. On Screen
6. Inside 99'er
7. Letters to the Editor
27. 99'er Digest
30. Hall of Fame
68. Group Grapevine
91. Shopping Bus
98. B.A.R.C. Back
99. Index to Advertisers

99'er Home Computer Magazine (ISSN 0745-6913) is published monthly by Emerald Valley Publishing Co., P.O. Box 5537, Eugene, OR 97405. The editorial office is located at 1500 Valley River Drive, Suite 250, Eugene, OR 97401. (Tel. 503-485-8796). Subscription rates in U.S. and its possessions are $25 for one year, $45 for two years, and $63 for three years. In Canada and Mexico add $7 per year. Other foreign countries $43 for one year surface mail. Inquire for air delivery. Single copy price in U.S. and its possessions is $3.50, and $4.00 in Canada and Mexico. Foreign subscription payment should be in United States funds drawn on a U.S. bank. Second-class postage paid at Eugene, OR 97401. POSTMASTER: Send address changes to **99'er Home Computer Magazine**, P. O. Box 5537, Eugene, OR 97405. Subscribers should send all correspondence about subscriptions to above address.

Address all editorial correspondence to the Editor at **99'er Home Computer Magazine**, 1500 Valley River Drive, Suite 250, Eugene, OR 97401. Unacceptable manuscripts will be returned if accompanied by sufficient first class postage and self-addressed envelope. Not responsible for lost manuscripts, photos, or program media. Opinions expressed by the authors are not necessarily those of **99'er Home Computer Magazine**. All mail directed to the "Letters to the Editor" column will be treated as unconditionally assigned for publication, copyright purposes, and use in any other publication or brochure, and are subject to **99'er Home Computer Magazine's** unrestricted right to edit and comment. **99'er Home Computer Magazine** assumes no liability for errors in articles or advertisements. Mention of products by trade name in editorial material or advertisements contained herein in no way constitutes endorsement of the product or products by **99'er Home Computer Magazine** or the publisher unless explicitly stated.

Each separate contibution to this issue and the issue as a collective work Copyright © 1983 by Emerald Valley Publishing Co. All rights reserved. Copying done for other than personal or internal reference use without the permission of Emerald Valley Publishing Co. is prohibited. Requests for special permission or bulk orders should be addressed to the publisher.

99'er Home Computer Magazine, 99'er Magazine, Home Computer Magazine, and HCM are all trademarks of Emerald Valley Publishing Co.

Texas Instruments, TI, Constant Memory, Solid State Software, Hex-bus and Command Cartridge are all trademarks of Texas Instruments, Inc.

Publisher/Editor-in-Chief
Gary M. Kaplan

Managing Editor
David G. Brader
Assistant Editors
Greg Roberts
Judy Sanoian
Technical Editors
Robert Ackerman
William K. Balthrop
Sharyn Lyon
G.R. Michaels
Patricia Swift
Copy Editor
Erin O'Connor
Contributing Editors
Henry Gorman, Jr.
Walter Hego
S. T. Holl
Roger Kirchner
Samuel Pincus
Steve Schwartz
Art Director
Hayder Amir
Production Manager
Norman Winney, Jr.
Production & Design
Kathy Garcia
Laredo
Barbara Mickelson
Typesetting
June Gaber
Julienne Laabs

Office Manager
Pat Kaplan
Administration
Deborah Amity
Charisse Loritz
Customer Service
Nita Agol
Renee Manning
Circulation & Fulfillment
Janie Cantu
Tom Ecker
Jonnie Hernandez
Benjamin Kaplan
Carol O'Brien
Lyndia Tennant
Bulk Distribution
Ann Crenshaw
Coleen Nelson
Financial Manager
Bob Karau
Accounting
Tasanee Fry
Patana Ratanapreux
Advertising Manager
Linda Brundige
Advertising
Shelly Albert
Cathy Greenberg Kelley
Tel. 503-485-8796

INSIDE 99'er

"Listen J.B., a TI-99/4A is a home computer and it's place is in the *home*!" Ah, not so, Mr. Senior Vice-President! Lately this cybernetic little scamp has been seen frequenting the work place. Oh yes, it's true! The hustle-bustle world of profit and loss, now has to sit up and take notice of the humble Home Computer and appreciate all it can do to spruce up the world of work.

Sprucing up your dress-for-success look may be just a matter of a quick *Bit One, Purl Two* according to our article from the Fashion Factory. Their BASIC program for a custom-tailored skirt will allow you to slip into something a bit more comfortable and stylish too.

Is your firm skirting the issues of production and profit because of the high cost of charting your progress? Worry no more—*Graphic Persuasion* is here to represent your state of affairs with stunning bar graphs. This BASIC program will help you make low-cost, colorful visual aids to impress the powers that be.

A rare meeting of powerful electronic brains is the subject of *An Ensemble of Assemblers* in which we examine three assemblers to see what they can do and how they run.

Running out of cash can happen in the best of businesses, but by using *Cashflow* and its Extended BASIC program, you can find out where your money goes and how to get the river of riches flowing in your direction again.

Does your office go with the flow, set trends, or leave well enough alone? In *Public Investigator* you'll discover how you can create a questionnaire to query your customers. This BASIC program will even compile, evaluate and print out the results for you. Talk about an ideal tally system!

While we're examining ideal forms, let's consult with the philosopher who taught us all about such things in our new feature, *PLATO's Progress*. Now that Control Data has made their learning library of educational software available to Home Computer owners, we will be communicating every new and exciting moment as it happens. This time we see how PLATO helps parents and children join forces for peak learning experiences.

Let's peek at what can happen when your computer is too big or too small for your business in *Mean Machines and Small Potatoes*. The moral of these two anecdotes will keep us from taking ourselves too seriously.

Our *Multiplan Medium* is still taking her work seriously. In this issue, our sage *Explores Rectangles* and speaks to us of ways to use rectangular groups of cells to expand *Multiplan's* usefulness.

Our LOGO turtle is more useful than ever too. In *Turtle Text*, the LOGO language becomes a versatile word processor and learns some new tricks including how to print a document that is really a procedure in disguise.

Things are not exactly what they seem in *Pocket Sunrise* either. . . they're better! The good Professor Holl brings us enough sunshine in his BASIC program to make Noah wish he'd taken a TI-99/4A with him on the ark.

Now that the sun is up, we'd like to awaken you to the possibility of using the Hex-bus as a communications link between the CC-40 and the TI-99/4A. In *Hello, Little Brother*, the Hex-bus helps these two machines send messages back and forth.

You can send your message in any language—or alphabet—with a compact new printer. See how it stacks up in our review, *Peripheral Vision 99*.

A business with the latest in printers needs the convenience of word processing. Our review of *Typwriter Keystrokes for Thrifty Folks*—tells about a low-cost word processor that won't spell disaster to your profit margin.

Marginal though some of your past attempts may have been, when you play our BASIC game, *Success Formula*, you will discover that you can pursue a career to make yourself rich, famous and happy before you're 41!

Of course, real life doesn't come with guaranteed second chances, so if you are looking for something that even a preschooler can count on, you won't be able to resist *Counting Fun*. A certain extraterrestrial joins up with his favorite playmates and toys for learning fun in this BASIC math game.

Toying around with snakes, fires, cannibals and acid pits may not be your idea of fun until you play our Extended BASIC game, *Jungle Jim*. If you believe in the old saying, "It's a jungle out there!", this game could be a good training ground for learning to survive any corporate chaos you may encounter.

"Corporation" and "business" need not, however, be synonymous with "confusion" and "bungles", as you will see after reading this months' special articles and regular features. Go ahead then, tuck your August issue into the secret compartment of your briefcase. Armed with these articles and programs plus the fresh applications you'll come up with, you and your trusty 99/4A can take the business world by storm. And when your co-workers ask, "What's a nice little Home Computer like that doing in a work place like this?" You'll know just what to say.

Until next month, have fun reading, learning and RUNing!

LETTERS TO THE EDITOR

Dear Sir:

I recently purchased Microsoft's excellent *Multiplan* and have found it to exceed all expectations. There is, however, a most glaring shortcoming not mentioned in your article contained in the April issue of *99'er*. Many other TI owners utilize the parallel connection between console and printer. Not only is the hardware less expensive, but the transfer rate is much faster than the 9600 baud serial rate. Yet when I first tried to print my spreadsheet results, I found to my dismay that the program is written to access only serial printers. Is there a "fix" or must I be forever limited to 'Planning sans hard copy? Please help with whatever information you can find. I am sure many other readers would be interested in you answer.

Robert F. Pinion
College Park, GA

You might have overlooked the directions for addressing printers on page 14 of the Multiplan User's Guide. *There you'll find the specifications for setting up the program with* either *serial* or *parallel printers. When you select the Print Options and enter the "setup" field, you need only to type "PIO" for Multiplan to print using the parallel port. If you don't specify this option, the default is "RS232.BA = 300": serial transmission at 300 baud.*

If your printer still will not print using this option, there is the possibility that it is cabled incorrectly. See the note on page 41 in Peripheral Vision 99 *in this issue.*

Dear Sir:

A company by the name of "Foundation" in Tiburon, CA advertises a 128K Memory Card for the 99/4A Peripheral Expansion System Box in *99'er HCM*.

Is this an acceptable product which functions as well as the TI-32K Memory Card but with a greater memory or are there serious problems and limitations?

Karlyn Shedlowski
Stroudsburg, PA

We are in the process of reviewing several memory expansion devices, and we'll print our findings in an upcoming issue.

Memory devices larger than TI's 32K memory expansion card will have to consist of multiple "banks" or "pages" of memory. These pages will have to be switched in and out rapidly to simulate a larger memory area. Even with a 128K board in place, the 99/4A will only "see" its first 32K of RAM because of the way it is memory-mapped. With the console's BASIC or the Extended BASIC cartridge, you'll only be able to address 32K of expansion memory. The only effective way to utilize the larger memory devices is through Assembly Language routines, either from the board's manufacturer, from another software house or of your own devising.

Dear Sir:

I've finally stopped playing and programming long enough to write. I have lots of questions, but a couple that have me stumped are (1) why won't the Speech Synthesizer say "WIN", "WAS", "NICE", "INCORRECT", "TEXAS INSTRUMENTS", "READY", "–", and "+"? Using the Extended BASIC module I've tried these words as both "word-strings" and "direct-strings." The words just get "spelled out" as letters. I had to replace "WIN" with "WHEN" in a game program.

Also (2) I can not get a return for diagonals using the joysticks. The corners are "dead."

SAMPLE

```
  100 CALL CLEAR :: CALL
    SPRITE(#1,42,2,95,130)
  110 CALL JOYST(1,X,Y)
  120 DISPLAY AT(24,1):X;Y
  130 CALL MOTION(#1,-Y,X)
  140 GOTO 100
```

You can never get "–4,4","4,4","–4,–4" or "4,–4" displayed. One return is always "0".

I'm sure the majority of your readers have only the console and a cassette recorder and, maybe, Extended BASIC. A few articles on LOGO or P-Code are fine but mostly give us more BASIC articles. I expecially don't like the Portable Computing section. I don't know anyone who owns a CC-40 and haven't seen one in the stores. How many of your readers use the CC-40 and why does the fact it's battery operated entitle it to a separate section? Its version of BASIC must be similar enough that a quick check of the owner's manual would answer the user's questions about differences from the 99/4A's BASIC.

Robert W. Hall
Godfrey, IL

Your Speech Synthesizer won't say some of the words in your list, Bob, because it is limited to the resident vocabulary. The words you list which are parts of phrases in the resident vocabulary—WIN in YOU WIN, for instance—are only *accessible in that phrase. And in order to have the Speech Synthesizer say the phrase completely rather than spell it out, the whole phrase must be enclosed in pound signs (#) as in the following statement:*

CALL SAY("#YOU WIN#")

The TI Extended BASIC manual has a list of these words and phrases on pages 203 through 205. In the case of the numeric symbols (+ and –), it will only say these words when they immediately precede *a number.*

As far as your joystick difficulties go, our resident gamester says that they may be due to the joysticks which you're using. Some—including TI's joysticks—are not very sensitive at the diagonals, and only intermittently return the values for the diagonals at precisely the right positions. There are brands of joysticks on the market, however, which will consistently return the diagonals.

We feel that the CC-40 merits more extensive treatment not because it is battery-powered, but because it is one of the first of the new generation of miniature computers with very broad capabilities. Besides the Compact Computer itself, a broad range of peripheral devices are being developed at Texas Instruments for this system. These include a Hexbus interface for the 99/4A, a Wafertape drive, an RS232 interface, a modem and a 4-color printer/plotter. When complete, it will form a very versatile system. You might look at the article on the CC-40 in this issue for an insight into some of the potential.

Dear Sir:

I am interested in Compact Computers, have a Radio Shack PC4 and Texas Instruments CC-40.

I'd be interested to read about any information you can pass along.

I read about it in the April 1983 issue of the *99'er Magazine* but there didn't seem to be a subscription card, hence the note: Is there such a thing as the Portable Computer Magazine?

Howard J. Cassidy Jr.
Cucamonga, CA

We'll be glad to pass along more information about the Compact Computer system as it becomes available. For now, Portable Computing Maga*zine(tm) exists solely as an insert of* 99'er HCM.

Continued on p. 68

Entering 99'er Programs

New readers should be aware that within the magazine's pages are found actual computer programs that *you* can put into your Home Computer and enjoy.

Make sure you have any special system components required by the program (e.g., the Speech Synthesizer, Extended BASIC cartridge, etc.). Then, using the console keyboard, you can type the printed magazine listing (character for character, and line by line) into the computer's memory.

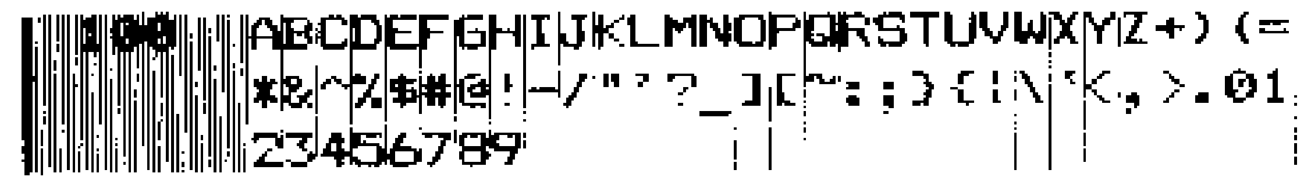
Before entering the program, connect a cassette recorder to the computer. Make sure you have two blank cassette tapes. For each 10-20 lines you type in, use SAVE CS1 to save that program segment onto one of the tapes. Alternate between the two tapes each time you save the program. Be sure to rewind to the beginning of each tape before saving, so that you always record over and replace the shorter segment of program lines with the longer segment. By following this procedure, you'll always retain most of your work even if the lights go out or someone turns off the computer.

Double check your typing against the program listing for errors, and *then* have someone else check it. The most common errors are typing the letter "O" instead of the number "0" (zero)—they are *not* interchangeable to the computer. This is also true for the letters "I" and "L" and number "1" (one). See "Key-In Reference"

Every time you make a correction to your program, SAVE CS1 and switch the tapes. Once all the errors are corrected, you will have a good copy of the program on the last tape. Before turning off the computer, put the other cassette tape in your recorder and once again SAVE CS1. Now, if one tape gets damaged, you won't have to enter the program listing via the keyboard all over again. Have fun and h py computing.

Programming Conventions

KEY-IN REFERENCE



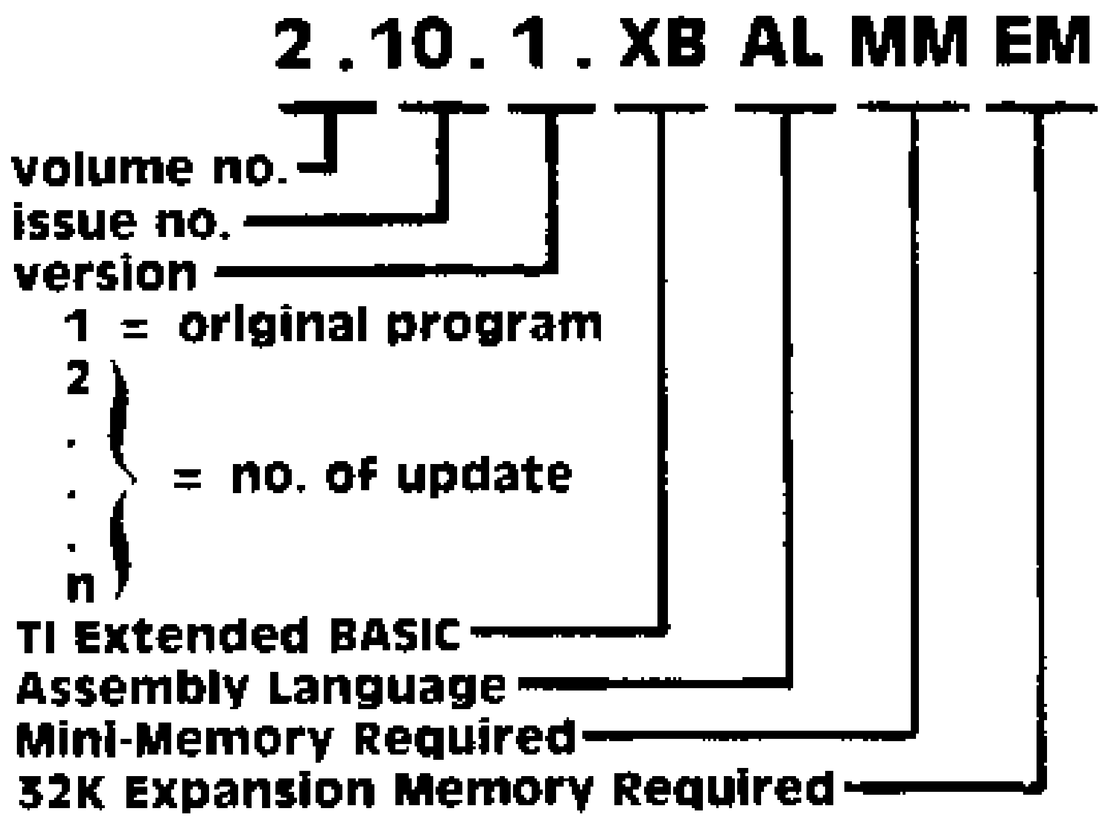
```
ABCDEFGHIJKLMNOPQRSTUVWXYZ+)(=
*&^%$#@!-/"'?_][~:;}{|\`<,>.01
23456789
```

99'er =End of Program or Article

compu-prestidigitation

(kóm·pū·prĕs´·teh·dĭ·jeh·tā´·shŭn) —*n.* **1.** The magical quality of unexpected comprehension that results from presenting technical information about computers in a lively, entertaining, visually attractive and easy-to-understand format. **2.** The magical tricks that make a computer sing, dance, and do all sorts of wonderfully useful things.

99'ER VERSION



BIT ONE PURL TWO

PROGRAMMING PATTERNS FOR A PERFECT FIT

By Pat Olsen

3511 Rucker
Everett, WA 98201

Hardware, software, and knitwear—they may seem like strange bedfellows. But combining the TI-99/4A with a marketable idea has produced many such unusual collaborations. Nowhere is this more evident than at The Fashion Factory in Everett, Washington, where one of the brightest new fashion ideas has come from the creative efforts of fashion designer Billie Buell and programmer-analyst Marty Keil—and, of course, the TI-99/4A. With each contributing technical information from her own field, the two businesswomen have developed a highly salable home computer knitting program. Hand or machine knitters need only enter their measurements and a knitting gauge, and the program produces a pattern to fit any size from 6 months through size 56.

Fashion designer Buell first entered the machine knitting market "Years ago when I had six kids at home, and couldn't knit fast enough with two needles to keep them all in sweaters and hats." Little did she know that there would be a day when she would be able to produce the patterns for six perfectly fitted sweaters, half a dozen hats, and maybe a coat or two in the same time it used to take her to run down to the store for a ball of yarn.

Buell has spent many years practicing the art of producing the perfect fit in clothing. She has taken the basic design shapes and grouped them in a logical way to come up with formulas that will work for all figure types.

The need for an accurate program arose when Buell opened her knitting-machine shop last year. In addition to knitting custom orders for her clientele, Billie had to chart patterns for them. Each pattern took at least an hour—often longer—to chart, and this left her little time for her other business duties.

"When a person is pressed for time, and there are phones ringing, people to help, and customers talking to you, it's hard to be sure that the pattern you have just charted will actually fit," says Buell. "Charting takes plenty of concentration and a liberal dose of peace and quiet to be positive that you will be able to knit a garment that fits."

"That's where microcomputers are put to good advantage," says Marty Keil. "Machines never become upset when people are looking over their shoulders while they are printing out patterns. Once we perfect the basic calculations, we know that our patterns will fit perfectly."

When Keil met up with Buell, she had just formed her own company to help small businesses take advantage of microcomputers. Buell already had a pretty good idea that the key to making up an easy home computer program to chart patterns lay in translating her ideas into BASIC language. "Billie had a good idea of what her TI-99/4A might be able to do," says Keil, "but no way to actually produce the program. We spent several days just exchanging information so that we each could begin to understand exactly how our respective machines would work."

Computer Meets Knitter

Although Keil had never seen a knitting machine and had no conception of how to design an accurate fashion pattern, she was able to work well with Buell's knowledge and ideas, turning them into programs that could be easily understood by any home knitter. Both agreed that the TI-99/4A was the best computer to use because of its ease of operation and ability to adapt applications for reprogramming into other home computers.

According to Buell, the body's contours coincide with geometrical configurations: "There are only so many different geometrical shapes that can be combined for a figure. These shapes can be defined in terms of parallelograms, rectangles, triangles, angles of any given degree, and curves which can join any of these angles." After the basic shapes that go into the design have been defined, the process that remains is one Buell compares to a child balancing building blocks. A shape builds upon the one that went before it, and all are connected with the soft lines which we call the "figure." In the process of designing a garment any of these shapes can be interchanged to establish the basic look of the end piece. For instance, a dolman-shaped sleeve would require a different set of geometric shapes than a simple fitted shell.

Buell's fabric is a machine knit, supple and adaptable to the human shape. To determine how many stitches or rows will

Continued on p. 11

GRAPHIC PERSUASION

Visual Aids to Make Your Point.

By Fred Ellis
P. O. Box 777
Edinburg, TX 78539

Numbers are abstractions that are sometimes hard to grasp; to understand and compare them quickly, it's often worthwhile to turn them into concrete representations—bar graphs, for instance. The program accompanying this article does exactly that: It turns abstract numbers into multicolored bar graphs. The program can easily be customized for different applications. Figures 1 and 2 are examples of graphs plotted by this program.

Properties of a Good Graph

The objective in making a graph is to communicate, and there are some definite and specific elements a good graph should contain. These include accurate scaling, clear numbering, and adequate labeling.

If the graph is to be projected from a 35mm slide, a good rule-of-thumb is that the slide should be readable when held at arm's length. If slides are made by photographing the CRT screen, this rule is met automatically by the size of the 99/4A's resident font. Another requirement is that the graph's axes be labeled, and the labeling should give the following information: (1) the name of what is represented, (2) numerical values, and (3) units.

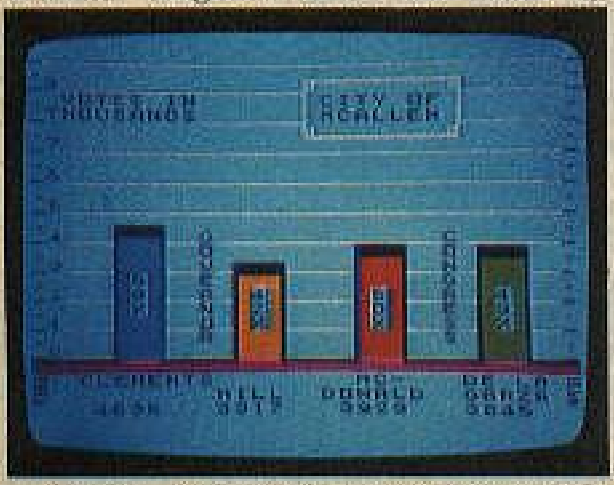


Figure 1. A graph plotted with the program *Bargrapher*. Bars were spaced to leave lots of room for labels.

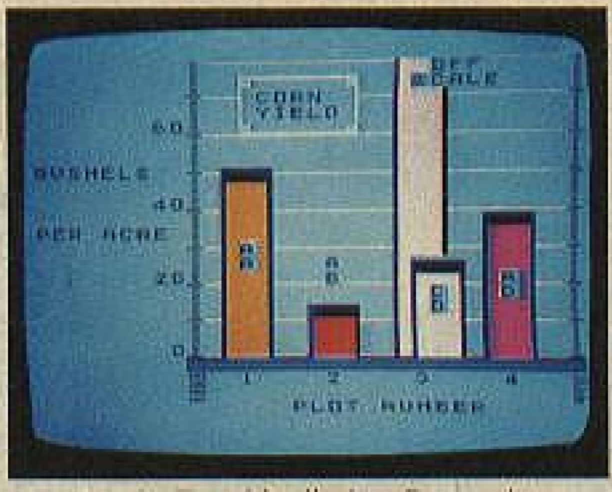


Figure 2. For this display *Bargrapher* was customized to put the vertical axis on column 10. Also shown is the response of the program to an off-scale datum.

Scaling the axes is a compromise. The taller the bars, the easier it is to read the graph, but you must leave enough space to accommodate the largest values in the data set. A good value to start with for this program can be found from the formula:

$$\text{SCALE} = \frac{\text{MAXVAL}}{20} \text{ units per character}$$

where MAXVAL is maximum value in the data set rounded up to the nearest multiple of 2, 5 10, or power-of-ten. For scaling and numbering, I recommend that multiples of 3 be avoided. In fact, I try to use consecutive integers, multiples of 2, multiples of 5, multiples of 10, or powers-of-ten.

Tick marks should be harmonious. For example, if the height of one screen character represents 10 units, making tick marks by turning on every other row of pixels creates tick marks that increment by 2½. Such markings are hard for the viewer to work with. How does one visually subdivide using 2½? In this case the best you can do with an 8-pixel-high screen character is to turn on the first and fifth rows to create increments of five. Actually, you may not even want tick marks that close together.

Each bar or bar group should be identified. It may be desirable to add associated numerical information such as percents. Last but not least, every graph should have a title. Graphs should be designed to please students, not professors; readers, not authors; viewers, not artists.

How to Use the Program

When using the *Bargrapher* program, you will find that you can change and reposition all the labels. In particular, the title with its box, can be placed anywhere on the screen. You can also change the color, position and number of bars (up to four), and incorporate various axis-labeling and tick-marking schemes into the program.

There are also two automatic features in the program. One of these is off-scale protection. If a datum is high enough to result in a bar whose top would be off-scale, the bar will be plotted "folded." The off-scale part will be plotted up from the baseline, and displaced to the right from the full-scale bar stem. The graph in Figure 2 includes an off-scale bar. A second automatic feature is the positioning of the percent label above the bar for short bars, which can be seen in Figure 2.

The program statements most likely to be changed are between lines 280 and 780. This part of the program is set off by the barbed wire (—*—*—*—) in lines 270 and 780. Non-cosmetic changes must be made within the later sequential parts of the program. Table I shows how to make various changes in th program.

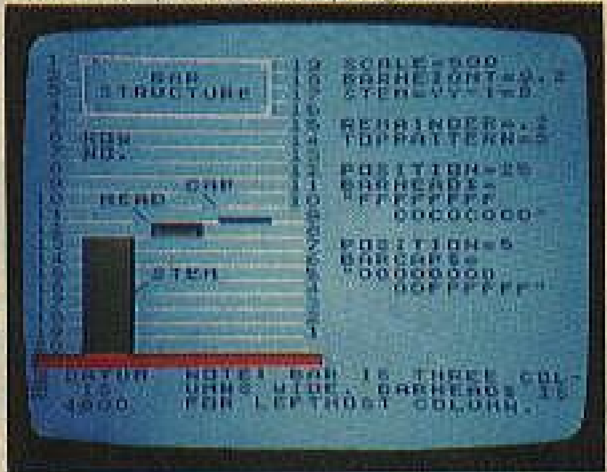


Figure 3. The three parts of a bar involved in the outlining routine. With this example, three pixel rows will be turned on in the bar cap, and in the bar head the top four pixel rows will be black.

Continued on

Norton Software
P.O. Box 575
Picton, Ontario
Canada K0K 2T0

TI99/4(A)

6 Reasons Why We're the "Name of the Game"™

NCC 1701
NCC 1701

1. **Cross Country Car Rally.** Fast action road race. (Ext. Basic only) (K) . . . . **19.95** Cassette
2. **Attack-man.** More than just a maze game. (Ext. Basic only) (K / J) . . . . **19.95** Cassette
3. **Super Frogger.** Cross 5 lanes of traffic, 2 barges, 3 logs, trecherous pirhana infested waters and get eaten by the alligators anyway! (Ext. Basic only) (K / J) . . . . **19.95** Cassette

(K / J) Keyboard and Joystick versions included
(K) Keyboard only

4. **3-D Startrek.** Adds an exciting new dimension to Startrek. (Specify Ext. or console) (K) . . . . **14.95** Cassette
5. **Lunar Lander.** Crash on your favorite planet; many challenging levels. (Specify Ext. or console) (K) . . . **14.95** Cassette
6. **Tank.** Blast the computer or an opponent. (Specify Ext. or console) (K / J) . . . . **14.95** Cassette

Diskette versions are $4.00 extra and require use of the optional memory expansion unit

Add $2.00 shipping and handling charges for less than three games.

Receive a 20% discount if you order 3 or more games.

All programs available in Ext. Basic unless otherwise indicated in the description. Please Specify

Ont. Res. add 7% sales tax

Send for a FREE brochure to get a complete description of our Applications, Games and Assembly Language programs.

Dealer Inquiries Welcome.

FIRST ADE™ FOR YOUR 99/4A!
COMPLETE 8 BIT DATA ACQUISITION AND CONTROL

ACCESSORIES SOFTWARE CONTROL CARD

FIRST ADE™ FEATURES —
▶ 8 ANALOG INPUT CHANNELS
▶ 8 DIGITAL INPUT CHANNELS
▶ 8 DIGITAL OUTPUT CHANNELS
▶ REAL TIME CLOCK W/BATTERY
▶ 3 MONTH WARRANTY
REQUIRES 32K & EXT. BASIC

FIRST ADE™ VERSION 1.1
DISK BASED/MENU DRIVEN
LOGIC FUNCTIONS
PROGRAMMABLE SETPOINTS

FIRST ADE™ INTERFACE
▶ 8 120V 6A RELAYS/RECEPTACLES
▶ 8 ANALOG INPUT TERMINATIONS
▶ 8 DIGITAL INPUT TERMINATIONS

TEMPERATURE PROBES

A/D ELECTRONICS
Box 26357
Sacramento, California
95826 (916) 363-8331

INTRODUCTORY OFFER!
$199.95 ▲ CONTROL CARD & FIRST ADE 1.1
79.95 ▲ FIRST ADE INTERFACE
19.95 ▲ TEMPERATURE PROBE
CHECK / M.O. / C.O.D. 3% SHIPPING/CA + 6%

ADE™

Purl Two . . . from p. 8

be used for each shape, the yarn is knitted to form a piece of fabric which is called a *swatch*. This swatch is measured to find the number of stitches or rows in one inch, and the results of this are called a *gauge*. Final calculations are found by multiplying body measurements by the stitch or row gauge. The resulting calculations are then multiplied to give the correct number of stitches to cast on for a given garment, as well as the number of rows to knit before increasing or decreasing the angle for the various types of shapings.

Although the process is a fairly simple one, it has taken years of study to understand how the pieces must fit together to form the whole. Buell felt that there were not many home knitters who would care to take the same time to research and understand body design. But Marty Keil was challenged by Buell's idea of using the TI-99/4A home computer and BASIC to shape garments. Keil was accomplished in the use of a mini-computer and COBOL, and happily she found that the TI-99/4A was a simple computer to work with. Given the precision of the geometric figures and the ease of the computer, the programs practically began to write themselves.

"One of the reasons that the programs were so easy to understand is that when a garment is knit, it begins at the bottom hemline and builds itself into some sort of geometric shape," says Keil. "It was a fairly simple matter to take the formulas, which were already in Billie's brain, and computerize them."

Also, according to Keil, the precise and mathematical art of charting lent itself perfectly to the flow-charting process. Keil emphatically stated that this is the most important part of the program and will provide the structure that is necessary to writing an easy program design.

"The formulas were intriguing," Keil said, "because all of the rectangles, triangles and parallelograms worked together to give a perfect fit to the human body. Small areas here and there added just enough fullness to produce a fit that wasn't precisely the molding of the form."

Keil went on to explain that the program uses so many subroutines because all garments use the same formulas, no matter what the shape. Once these subroutines were developed, one program could write the next with very little variation.

"It was a real learning process for me," said Keil. "Working with BASIC, learning terms used by machine knitters, and maintaining flexibility to allow the user to still be able to design within the program framework was a real challenge."

Pattern Enterprise

Although all of the programs Keil has designed were written on the TI-99/4A, they can be and are being rewritten to work with any other home computer. That way a home knitter not familiar with the shapes needed to understand charting will have no problem feeding in either a cartridge or a disk to the home computer. The work and expertise are already there. The knitter merely adds in the correct measurements plus the gauges taken from a sample swatch of knit fabric. Within the minutes it takes to process the input figures, the computer produces a complete and perfect-fitting personal pattern that will knit easily into a custom-made garment. Buell and Keil have produced a series of programs that cut the time of charting from hours to minutes and are, above all, accurate.

More and more knitters have begun to take advantage of knitting programs which they can take home and use whenever they are ready to knit. Customers like the fact that they can by-pass years of training in both charting and computer programming and use programs to customize their own fashions. When Buell and Keil became aware that their programs could be adapted to other computers and marketed anywhere in the country, they began advertising in national knitting magazines. They now fill orders all over the United States.

For knitters who don't own or have access to a computer, Buell and Keil also started a computer pattern club. Knitters can pay for a membership on a yearly basis and obtain the same patterns for a nominal fee by just sending in their measurements and knitting gauge. The pattern service has begun to flourish as

Continued on p. c

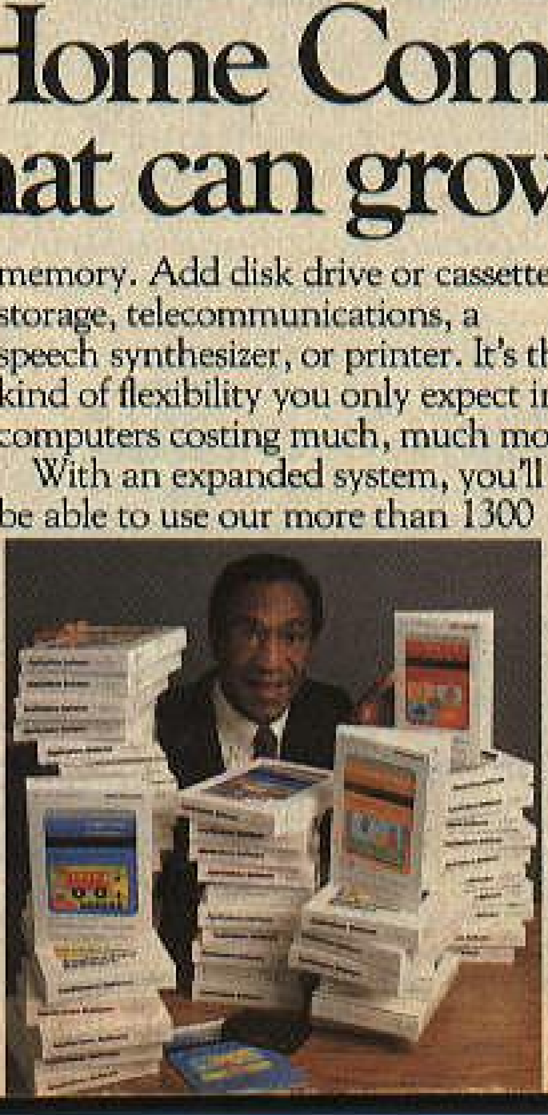
TI's Home Computer. The one that can grow with you.

No other home computer in this price range gives you more features, more ability to expand, or more fun.

Instantly useful. A true family computer. Only Texas Instruments gives you a choice of more than 80 Solid State Software™ cartridges. Programs for education. Information management. Entertainment. Computer programming. Finance. Word processing. And many more. Just plug them into your TI-99/4A Home Computer and you're ready to go.

Grows with you. Then, when you're ready to do more, you'll discover how easily your TI-99/4A Home Computer can expand with low-cost peripherals. Plug in more memory. Add disk drive or cassette storage, telecommunications, a speech synthesizer, or printer. It's the kind of flexibility you only expect in computers costing much, much more.

With an expanded system, you'll be able to use our more than 1300 diskette- and cassette-based programs. Take advantage of advanced languages. Get more programming flexibility. Or, connect to the outside world for weather forecasts, Dow Jones reports, even shop at home *electronically.*



Compare. Feature for feature, TI gives you more now. And more to grow with. Ask your TI dealer for information or call (800) 858-4565.

Creating useful products
and services for you.

TEXAS
INSTRUMENTS

Copyright ©1983 Texas Instruments

PLEASE HELP THANK YOU

Detach, fold and mail. See other side for instructions.

IF YOU HAVE ALREADY ANSWERED OUR QUESTIONNAIRE . . . Please check here ☐ and simply return your B.A.R.C. BACK selection.

Think of it—

This 4-minute Questionnaire can *actually* impact the Home Computer revolution!!!

FOR ALL READERS

1. **Are you presently a subscriber?** ☐Yes ☐No
2. **If not, do you intend to become one within the next 3 months?** ☐Yes ☐No
3. **If not a subscriber, where did you get your copy?** ☐Newsstand ☐Supermarket ☐Bookstore ☐Airport ☐Users group ☐Computer store ☐Chain/department store ☐Borrowed from friend ☐Other place
4. **What category of articles do you enjoy the most?** ☐BASIC programming tutorials ☐System tutorials ☐Photo features & news items ☐Game programs ☐Education programs ☐Utility programs ☐Product reviews ☐LOGO articles
5. **How much total time do you spend with each issue?** ☐Less than 2 hours ☐2-4 hours ☐5-7 hours ☐8-10 hours ☐11-13 hours ☐over 14 hours
6. **How many other computer-related magazines do you currently read?** ☐None ☐1 ☐2-4 ☐5 or more
7. **Are you** ☐Male ☐Female ☐Under 16 years of age ☐16-20 ☐21-25 ☐26-30 ☐31-35 ☐36-40 ☐41-50 ☐over 50
8. **Are you a student?** ☐Yes ☐No
9. **What is your annual household income?** ☐Under $5000 ☐$5000-$9999 ☐$10,000-$14,999 ☐$15,000-$19,999 ☐$20,000-$24,999 ☐$25,000-$30,000 ☐over $30,000
10. **What is your ZIP code?** ☐☐☐☐☐

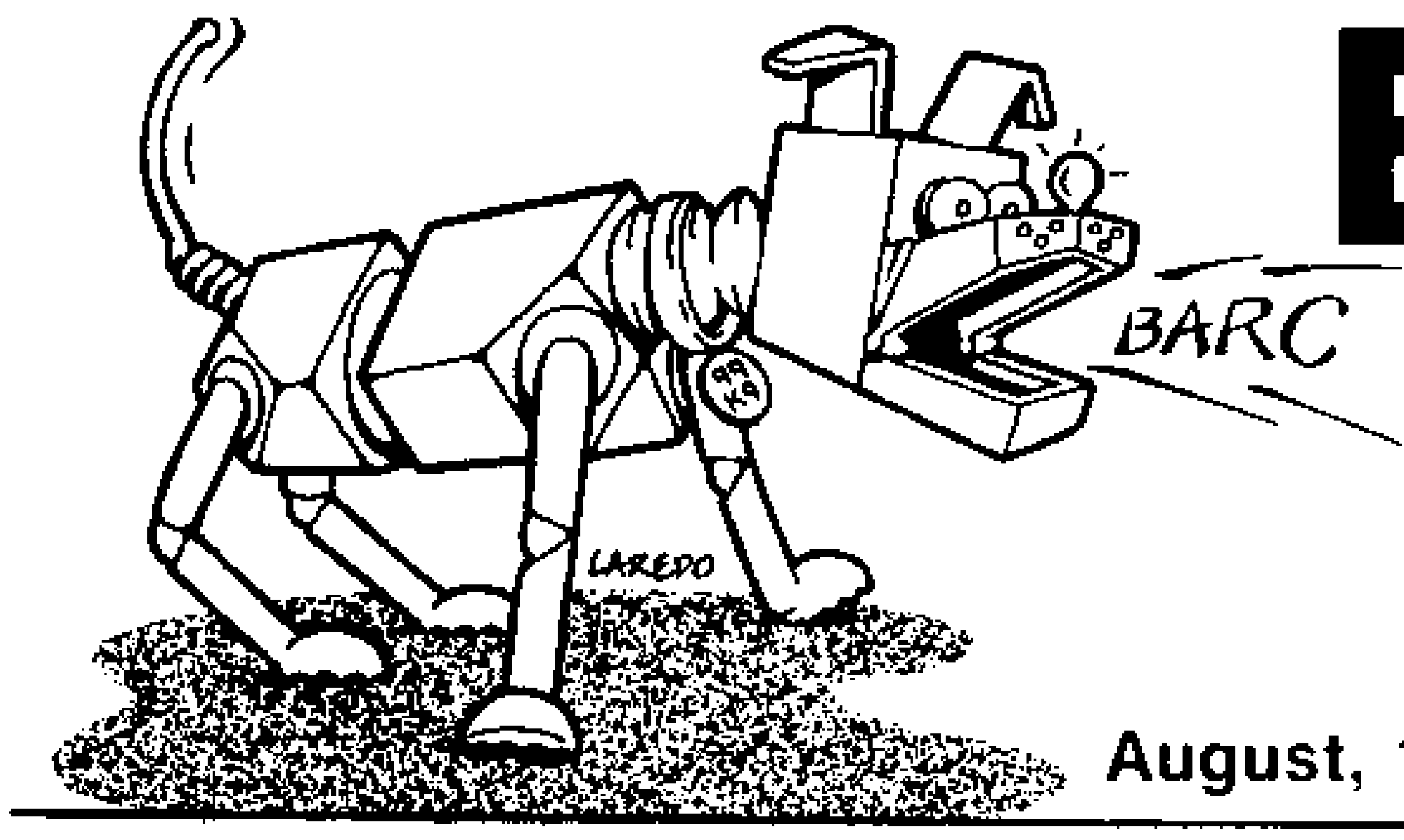
FOR READERS WHO DON'T YET HAVE A TI COMPUTER

1. **Do you intend to buy a TI computer?** ☐No ☐Yes (within 3 months) ☐Yes (within 3-6 months) ☐Yes (within 6-12 months)
2. **Which do you think you'll purchase?** ☐TI-99/4A Home Computer ☐Compact Computer 40
3. **What do you anticipate your primary use of a TI computer will be?** ☐Entertainment ☐Education ☐Computer literacy ☐Household management ☐Job-related homework ☐Business ☐Professional use

FOR PRESENT TEXAS INSTRUMENTS COMPUTER USERS

1. **Which system(s) do you currently own?** ☐99/4 ☐99/4A ☐CC-40
2. **What was your primary reason for buying it?** ☐Entertainment ☐Education ☐Computer literacy ☐Household management ☐Job-related homework ☐Business ☐Professional use
3. **What was your primary reason for buying the Texas Instruments brand?** ☐Company name/reputation ☐Features for the money ☐16-bit microprocessor ☐Convinced by friends/relatives ☐Ease of use ☐Prior use in course or "Advantage Club"
4. **Which additional TI computer are you likely to purchase within the next 6 months?** ☐None ☐99/4A ☐CC-40
5. **What peripherals do you currently use?** ☐Cassette recorder ☐Disk controller & drive(s) ☐Peripheral Expansion Box ☐RS232 ☐32K Memory Expansion ☐TV ☐B/W monitor ☐Color Monitor ☐Speech Synthesizer ☐Joysticks ☐Printer ☐Modem ☐p-Code Card ☐Hex-bus Adapter ☐Wafertape Drive
6. **Put a CIRCLE around the above peripheral you are most likely to buy within the next 6 months.**
7. **Mark all TI language software you own or plan to buy within 6 months.** ☐Extended BASIC ☐99/4A Editor/Assembler ☐UCSD Pascal ☐LOGO ☐Forth ☐Mini Memory ☐Pilot ☐CC-40 Editor/Assembler
8. **How much money do you expect to spend within the next 12 months on your computer system?**
   - **Software** . . . . ☐None ☐less than $30 ☐$30-50 ☐$51-100 ☐$101-250 ☐over $250
   - **Peripherals** . . . . ☐None ☐less than $50 ☐$50-100 ☐$101-250 ☐$251-500 ☐over $500
   - **Books** . . . . ☐None ☐less than $10 ☐$10-25 ☐$26-50 ☐over $50
   - **Blank tapes & disks** . . . . ☐None ☐less than $15 ☐$15-35 ☐$36-75 ☐over $75
   - **Furniture, dust covers, & accessories** . . . ☐None ☐less than $25 ☐$25-100 ☐over $100
9. **How many software CARTRIDGES do you expect to purchase within the next 12 months?** ☐None ☐1-3 ☐4-7 ☐8-12 ☐over 12
10. **What % of the above CARTRIDGES will be for entertainment?** ☐0% ☐less than 25% ☐25-50% ☐51-75% ☐76-100%
11. **Circle above what % of the CARTRIDGES will be for education.**
12. **Have you purchased from any of our advertisers in the magazine within the last 6 months?** ☐No ☐Yes, Software ☐Yes, Peripherals ☐Yes, Books ☐Yes, Blank tapes & disks ☐Yes, Furniture, dust covers & accessories
13. **About how much money have you spent on the above purchases?** ☐less than $25 ☐$25-50 ☐$51-100 ☐$101-250 ☐$251-500 ☐$501-1000 ☐over $1000
14. **On the average, about how many program listings in each issue do you key into your computer and use?** ☐None ☐1 ☐2 or 3 ☐4 or more

---



B.A.R.C.* BACK

***(Best Article—Reader's Choice)**

Let us know what you like by voting for your favorite article or program in this issue. The winning author will receive a bonus of $100.00

August, 1983

	Page	Article	Author		Page	Article	Author
☐	8	Bit One, Purl Two	Olsen	☐	58	Mean Machines	Roberts
☐	9	Graphic Persuasion	Ellis	☐	64	Multiplan Medium	Swift
☐	14	An Ensemble of Assemblers	Swift	☐	69	Turtle Text	Kirchner
☐	19	Cash Flow	Moskowitz	☐	73	Hello, Little Brother!	Ackerman
☐	32	Jungle Jim	McCue	☐	76	Plato's Progress	Lyon
☐	33	Success Formula	Davis	☐	83	Pocket Sunrise	Holl
☐	34	Counting Fun	Brantley	☐	86	Public Investigator	Douglas

FOX VALLEY SOFTWARE

METEOR ALPHABET—A very colorful, educational, & exciting program. Helps teach letter, & number recognition, & promote early keyboard training for ages 2 to 5. The graphics are excellent & capture childs attention. Screen shows a view seen by Jupiter-Bound Voyager 1 in September 1977, of the Earth, Moon & Stars. (REQUIRES EXTENDED BASIC & SPEECH SYNTHESIZER)

COMPUTERIZED CRAYOLA—a fun graphics program for young and old. Paint the screen & let your imagination run wild. Also great for designing quilts or afgans. (BASIC)

MORTGAGE & LOAN AMORTIZATION SCHEDULE—figures monthly payment, interest, principal and balance for each month, for term of mortgage or loan. Screen displays one full year at a time, and has exit option. (BASIC)

HOME BREWED ANTENNAS—a very useful program for hams—S.W.L.'s-T.V. Dxer's and C.B.er's. Covers Quads, Quagis, Inverted V, Dipoles and Longwires. Also computes how much to prune from first S.W.R. curve. (BASIC)

ALL PROGRAMS ON CASSETTE TAPE AND ARE $14.95 EACH. SHIPPING AND HANDLING ARE FREE.

SEND CHECK OR MONEY ORDER TO:

FOX VALLEY SOFTWARE
P.O. BOX 52
SOUTH ELGIN, ILLINOIS 60177

DEALERS INQUIRIES INVITED.

Minerva Communication Centre Limited

presents...

LOGO procedures on video tape.

Turtles on T.V.

★ One-hour BETA or VHS video cassettes demonstrate and explain LOGO primitives, procedures, and problem solving strategies.

★ A step-by-step introduction to LOGO for the APPLE II and the TEXAS INSTRUMENTS 99/44A microcomputers.

★ These visual presentations combined with voice-over narration show the range and power of LOGO to parents, teachers, pupils, and school administrators.

Title	Code	U.S. Price	Quantity
LOGO Geometry for the APPLE II	**LGA**	**$60.00**	______
LOGO Geometry (with Sprites) for the TI 99/44A	**LGT**	**60.00**	______
List Processing for the APPLE II	**LPA**	**60.00**	______
List Processing for the TI 99/44A	**LPT**	**60.00**	______

Minerva Communication Centre Limited
5435 Spring Garden Road
Halifax, Nova Scotia, Canada B3J 1G1
1-(902)-429-3268

Persuasion . . . from p. 9

Other changes would require considerable programming—for instance, trying to have more than four bars of different colors. As it stands now, the program uses all of the user-defined character sets. (I just wish there were more character sets available.) Also, if the bars are to be individually labeled, four bars are about the most you can fit on the screen without running out of space for labels.

Description of the Program

For title and labels and their respective positions on the screen, there is a rather long subroutine near the beginning of the program, starting at lines 290 and ending at 650. Statements for data, bar color, and vertical axis markings are next and bring us to line 790.

Most of the special screen characters used in the program are defined with data statements and a CALL CHAR loop. These data statements are at lines 790 and 840, and the defining loop uses the following lines up to line 890. If you try to define these characters by typing in individual CALL CHAR statements, you are going to get an acute attack of *ennui*. All the color sets are defined next. The statements that actually do most of the mechanics of drawing the grid lines, tick marks, etc., and labeling the graph are lines 1000 to 1260. At this point in the program the screen is ready for the bars.

The interesting part of the program is the loop which plots the bars. There are two special functions of this loop. First, the loop dynamically plots bar heights to one-pixel resolution. The characters used at the top of each bar are defined during program execution by the code between lines 1370 and 1800 using the long strings in lines 1280, 1290, and 1300. Hexadecimal strings which define the bar-top characters are taken from these strings using SEG$ statements, with position determined by the data. For instance, such selection and definitions are made by lines 1390, 1400, 1560, 1570, and 1580. (the article, *Dynamic Manipulation of Screen Character Graphics* in *99'er HCM*, Vol. 1, No.6, described this technique.)

The second special function of the loop is to put black outlines around the bars. Without the outline the edges of the bars appear smeared, fuzzy, and blurred.

Following the bar-drawing loop, the vertical axis is labeled, and the title and its box are added. Note that the title box will "paint over" anything else on the screen; thus you will have to move it if it covers up the top of a bar. Next, lines 2370 and 2380 hold the display on the screen using the CALL KEY subprogram. After the END statement there are subroutines for printing vertical and horizontal labels. The last subroutine draws the bar stems. In the case of an off-scale bar, program execution will pass through this routine twice, the second time to draw the off-scale part of the bar.

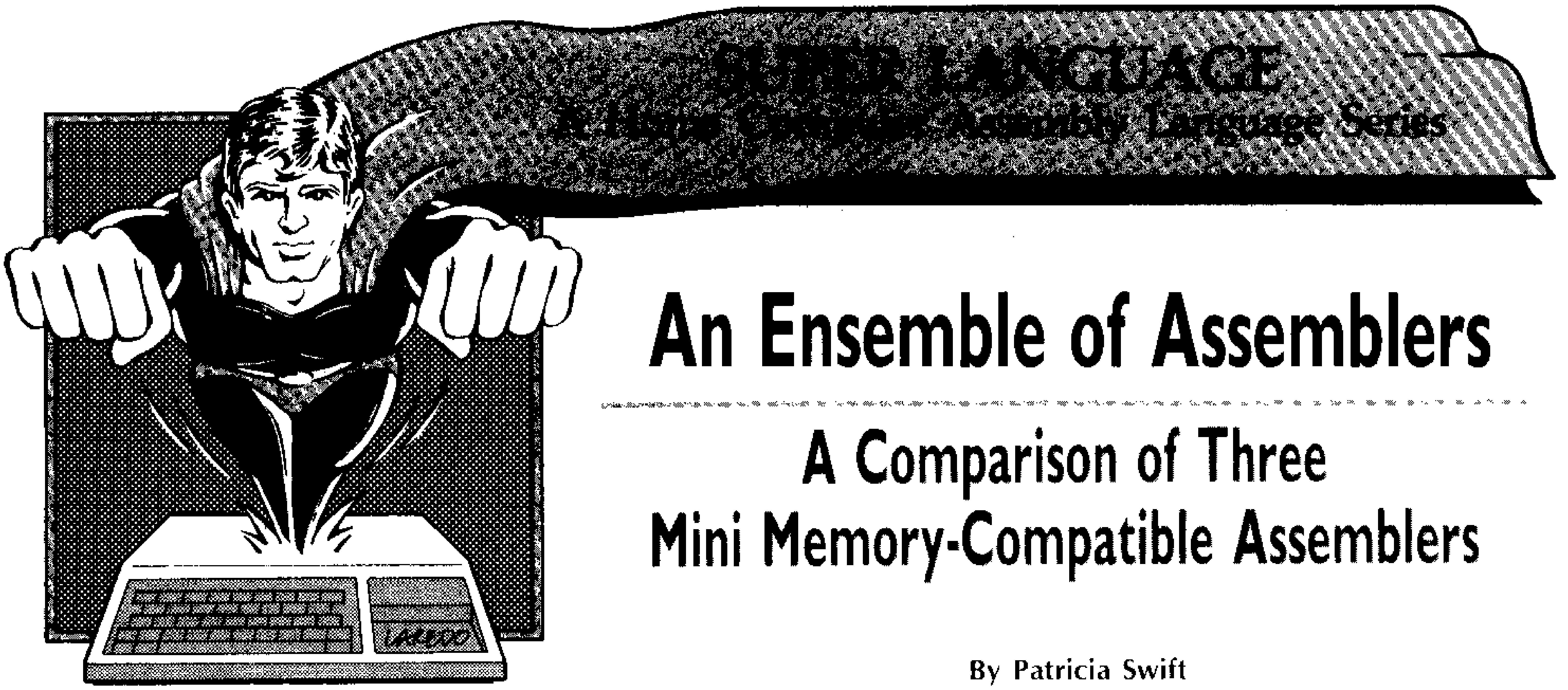
Rather than data statements the program could use files or arrays. Thus lines 190, 1350, 1360, and 2390 are reserved for possible use with files on cassette or floppy disk.

Outlining

As mentioned earlier, a black outline is used around the bars so their edges will not appear blurred. Part of this blurring can be blamed on the computer and its CRT monitor; I assume that this is due to such things as the CRT screen matrix, bandwidth, circuit ringing, overshoot, stray coupling, etc. Be that as it may, the blurring is real, although the effects are not equal in all directions: The horizontal smearing is worse than the vertical, and it smears to the right. The situation is worse with red. Light red especially will bleed far into colors to the right. But there is very little smearing with black, probably because black is achieved in a CRT by completely shutting off the electron beam.

But the other part of the trouble is in *front* of the CRT. The human eye does not do a good job when certain color pairs lie next to one another. For example, a red area adjacent to a yellow area will appear fuzzy *even* with good monitor resolution. Drawing a narrow black line between these areas will make the boundary appear sharp.

Continued on p. 55



An Ensemble of Assemblers

A Comparison of Three Mini Memory-Compatible Assemblers

By Patricia Swift
Technical Editor

Assembly languages are traditionally highly symbolic, with mnemonic operation codes representing fairly simple instructions. An *assembler* is a program that changes Assembly Language statements into the machine code which can be executed directly by the computer. No matter what kind of assembler you use, you need a place to put the machine code it generates. This machine code must be in RAM (random access memory) that is directly addressable by the microprocessor if the computer is to run it. There is only a small amount of this addressable RAM in the console itself. The Mini Memory Command Cartridge contains 4K of RAM, and the expansion memory gives you another 32K. For users without expansion memory, the Mini Memory is the least expensive way to add enough RAM to do some significant Assembly Language programming.

All three of the assemblers reviewed in this article use the Mini Memory. (They also build machine code in the expansion memory if you have it.) While disk drives and printers may be supported, I used only one cassette recorder in comparing the packages.

Texas Instruments' Line-by-Line Assembler comes with the Mini Memory at no additional cost. The MAX Assembler from M.K. Eckhaus is available for $25. The Dow Assembler by John T. Dow costs $25. All three are shipped on cassette tape, let you use Assembly Language based on 9900 Assembly Language, and all three can build machine code in the Mini Memory's RAM. But the similarities end there. In other ways, the three could hardly be more different.

The documentation for all three of these assemblers was adequate. Since none of them describes the assembler statements in detail, all three wisely recommend that you also purchase TI's Editor/Assembler manuals. Novices should be aware that none of these manuals, not even the Editor/Assembler manual, teaches you how to program in Assembly Language; they cover the mechanics of the languages, not how to think in assembler.

How They Work

These assemblers take in Assembly Language statements from the keyboard and put machine code into the Mini Memory. In order to do this the assembler must keep track of any symbolic names and labels you use. This is done in a *symbol table* where labels and their addresses are kept. Once the assembler has finished its work by creating a machine-code module, the assembler and its symbol table are no longer needed in RAM. You can use EASY BUG (which comes with the Mini Memory) to save the machine code from the Mini Memory to cassette tape no matter which assembler you use.

It's not enough to merely put the machine code into the Mini Memory *somewhere*. The program name should be placed in the REF/DEF table so it can be referenced later. This table starts at >7FFF and grows toward >7000; its size is determined by the number of entry points you need. The two-byte address at >701E, called the *Last Free Address in Mini Memory* (or LFAM for short) tells the system where the top of the REF/DEF table is. If an entry is added to the REF/DEF table, the LFAM must usually be adjusted to reflect this.

The Mini Memory contains RAM addresses >7000 through >7FFF. The first part of this memory (addresses >7000 through >7117) is reserved for system use. Assuming a minimum of one entry in the REF/DEF table to define your program's entry point, you are left with Mini Memory locations >7118 through >7FF7, or 3808 bytes available for your use. The three assemblers vary greatly in how many of those 3808 bytes can be used for the finished machine code program.

The machine-code modules created by all of these assemblers can be moved using the *Mini Memory Relocator* program (published in the May, 1983 issue of *99'er HCM*). This relocator allows you to overcome some of the size restrictons of these assemblers. After splitting the program into two or more logical chunks, you process each module through the assembler and save it with EASY BUG. Then use the *Mini Memory Relocator* to relocate the modules from wherever they were loaded originally to other locations in the Mini Memory. This technique allows you to construct programs which use all 3808 bytes in the Mini Memory, but you can see that it is not the most convenient process.

As your Assembly Language proficiency increases, the question of how large your programs can be will become important. To give you an idea of the sizes you'll be working with, the simple sprites programs which appeared in the April, 1983 issue of *99'er HCM* occupied about 260 bytes of machine code.

If your Assembly Language programs run perfectly the first time and never need to be changed, then the question of what happens to your source program will never come up. In real life, things are never that simple. You can be sure that you will need to change your program at some point. The three assemblers cope with this need in different ways, as noted in each section.

Another important consideration is speed—how long does it take you to arrive at debugged machine code? This is the most important question of all. The answer will vary for different individuals. If you compose your source program at the keyboard, then a momentary hesitation between entries of source lines will probably not slow you down at all. If you carefully write out your programs first, then you will want the entry into the computer to be as fast as possible. Programming style and proficiency are also factors: Do you program in smallish modules and test them singly, or do you enter the whole program at once? Is most of your time spent debugging rather than composing the program initially? Do you already know 9900 Assembly Language? If you do, be careful not to make hasty assumptions, because each version of Assembly Language closely resembles 9900 Assembly Language. This similarity can also be confusing if you're using TI's Editor/Assembler Manual.

Line-by-Line Assembler
Texas Instruments
Consumer Relations
P.O. Box 53
Lubbock, TX 79408
Cassette, $99.95 (includes Mini Memory cartridge)

TI's assembler is an *instant assembler*. This means that each source statement is translated into machine code and stored in the Mini Memory as soon as you enter it. You can actually see the code which is generated, and the translation is extremely fast. If you refer to a label which has not yet been defined, the assembler generates a reference (you see an R). When you (hopefully) define the label later, the assembler fills in the address(es) right before your eyes. All this action may be confusing at first, but it will quickly become an education in machine code as well as a valuable self-checking device. You can display the symbol table at any time to see what labels have and have not been defined. As soon as you finish entering your program, the machine code will be in Mini Memory ready to be executed. You must put the program's entry point into the REF/DEF table and adjust the LFAM pointer explicity; this can be done via the Line-by-Line Assembler.

The form in which you enter each statement is very simple. If the statement has a label (two characters maximum) you enter it, and follow with a space. If the statement has no label, you just type a space first. Next comes the op code followed by a space, and the operands, separated by a comma. The ENTER key signals that the statement is finished. If the statement has a syntax error, the assembler tells you right away. You are not obliged to spend time lining up your source columns.

The Assembly Language supported by the Line-by-Line Assembler is very close to 9900 Assembly Language. The instruction RT is not implemented (use B *R11 instead), and only seven assembler directives can be used: AORG, BSS, DATA, END, EQU, SYM, and TEXT. Comments are not allowed, and labels may be only two characters long. Otherwise, the Line-by-Line Assembler's statements are just like those described in the Editor/Assembler manual. Figure 1A shows a portion of the sprites program as it would be entered into the Line-by-Line Assembler.

TI's assembler resides in the Mini Memory itself, and so does the symbol table. This increases its speed, but it also greatly reduces the space available for your program. For all intents and purposes, the Line-by-Line Assembler uses address >7118 through >7CD7. The symbol table starts at >7CD8 and grows toward >7FFF. (Its actual size depends on the number of labels you use in your program.) The default starting point for your machine code program is >7D00, which leaves you room for nine labels. To use the Line-by-Line Assembler, you should have its two entry points (OLD and NEW) in the REF/DEF table, as well as one for the program you're building. This means that addresses >7FE8 through >7FFF are occupied by the REF/DEF table. Therefore you have 744 bytes for your machine code program (>7D00 through >7FE7) in this environment. If you use no symbolic names at all, you can start your program at >7CE0 and thus squeeze in 776 bytes of machine code, but it's hard not to use any symbols or labels. If you want to use more than nine labels, then you must start your program at a higher address than > 7D00 (easily done via the AORG directive), but this shortens the room available for your program.

The sample program *Lines* which comes with the Mini Memory illustrates an important point about program size. When you first load the cassette tape into the Mini Memory, both the Line-by-Line Assembler and *Lines* are present in Mini Memory. The program logic and initialized data areas for

CSI

CHALLENGER SOFTWARE INTERNATIONAL
Introduces
A New Line Of Quality Cassette
Software Programs Specially Designed
For Your TI 99/4A Computer.

1. *STARPROBE 99.* You control the starship as it probes a multilevel, labyrinthine, and hostile world. An action game of skill with superior, full-color graphics. Created in BASIC by Mark Sumner. $17.95

2. *3-D STALKERS.* The ultimate 2-player strategy game. You and your opponent are trapped in a three-dimensional maze from which only one can escape. A Mark Sumner game of wits and cunning written in BASIC with joystick control. $17.95

3. *WALLABY.* Wally Wallaby has stumbled into the basement of the Tasmanian Thing-a-ma-jig factory. Won't you please help him hop, duck, climb, and slide his way to the exit. A Mark Sumner game in EXTENDED BASIC, with 4 screens and 2 playing levels. $17.95

4. *HORRORS!* You'll have a nightmare of fun as you try to paint a haunted house while evading the clutches of some of the dumbest and smartest monsters you'll ever meet. A new EXTENDED BASIC game by Mark Sumner, with 16 different playing combinations. $17.95

5. *MU OUTPOST.* Past and future come together as you defend the undersea Ionian empire of MU against the forces of the Kingdom of Han. Brilliant graphics. Joystick control. An EXTENDED BASIC game by David Farmer. $17.95

6. *DRAW POKER.* Play DRAW POKER against your TI computer. You will never find a computer game closer to the real thing. Created by Ken Dibble in BASIC, with superb logic and realistic play. $17.95

7. *GAME OF THE 50 STATES.* An educational game about the capitals and nicknames of the 50 states. Features include color graphics, sound effects, and optional speech interaction. Created in BASIC by Roy Tamashiro. $17.95

Ask for Challenger Software at your local TI dealer or use the order form below. Each game comes in an attractive box with full and easy-to-follow instructions and a trouble shooting guide for the cassette user. All games © 1983.

DEALER INQUIRIES INVITED.

Please send me the programs circled.
1 2 3 4 5 6 7
Add $1.50 for Shipping and Handling. Total enclosed $______. (Send check or money order or use VISA or MASTERCARD. No cash or C.O.D. please.)
Name ______ Signature ______
Address ______
☐ M/C ☐ VISA Exp. Date ____ Card No. ______

CHALLENGER SOFTWARE INTERNATIONAL
P.O. Box 50150
St. Louis, MO 63105

SOFTWARE OUTLET for TI-99/4(A)

EDUCATION

HAPPY MATH- Colorful graphics 3,B,C$12.95
SPELL & PHONICS- Compose lessons.3,B,C$12.95
COUNT-COINS- Colorful & realistic. 3,B,C$12.95

ENTERTAINMENT

CAVERN QUEST - You venture through mysterious caverns in search of hidden treasure. Obstacles & foes multi-screen action. 1,C or D,XB $19.95

STRIKE FORCE 99 - Exciting 3-D, Destroy the Cryolian death ship. 1,C or D,XB $19.95

KONG - You must see it to believe it. 6 screens, all different like arcade game. 2,C or D,XB $15.00

FROGGY - Cross traffic lanes then river logs. Action fast & smooth. Sound & music. 2,C or D,XB $9.95

Each game pak only 26.95
Pak/1 - 5 games,including *Froggy & Baseball*, 2,C,D,XB
Pak/3 - *Kong, Bouncer, Romeo*, 2,C,D,XB

Intro Special
2 item deduct 10%
VISA,MASTER-honored
Ship & Hdlg add$2.50

M.W.RUTH CO.,Dept.983
510 Rhode Island Ave.
Cherry Hill,N.J.08002
(609)667-2526

Dealers
Welcomed
Free
Catalog

C=cass., D=disk, XB=extended basic, B=basic
1=Moonbeam 2=Extended Software Co. 3=Maple Leaf
We stock what we sell, for fast delivery.

ATTENTION
Software Authors
FOR QUALITY
CASSETTE DUPLICATION
RELY ON

DIGITAL AUDIO

P.O. Box 3024
Springfield, MO 65808
(417) 869-3811

ALSO AVAILABLE
Professional Quality Casssettes
Premium AGFA tape
in professional 5-screw shells

C-10		NORELCO STYLE BOX		C-20	
EACH	DOZEN	EACH	DOZEN	EACH	DOZEN
64	6 90	19	2.05	74	7.90

TRACTOR FEED CASSETTE LABELS
3.50/100 28.50/1000
QUANTITY PRICES AVAILABLE

Lines all fit between >7D00 and >7FE7. After you run the program *Lines*, the Line-by-Line Assembler is no longer present. This is because *Lines* uses some workspace between address >7118 and >7D00, thus obliterating portions of the assembler. This illustrates two points: 1) The assembler does not need to be present during the execution of the program it created, and 2) you can effectively use other areas of RAM for workspace at RUNtime, as long as you don't need to initialize the workspace beforehand. This way you can use the Line-by-Line Assembler to create programs which are really much larger than 744 bytes.

While you are using the Line-by-Line Assembler, it maintains a small screen buffer. You can scroll up and down to view the last nine screens if you want to check your work. But if you want to change a previous statement, you may have problems. Different Assembly Language statements generate different lengths of machine code. If you want to replace an SRL statement with a JGT statement, that's easy because both are the same size. You can scroll the screen up to find the address of the SRL statement, type an AORG command to get to the right spot in memory, and then type in the new JGT statement there. The assembler will generate the code for the JGT right over the old SRL. Then AORG yourself back to where you were before and continue entering the program. But if you want to replace the SRL statement with a longer MOVB instruction, you usually have to go back to the SRL statement and re-enter the program from there on down, starting with the new MOVB statement. If you catch your mistake right away, this isn't much work.

Aside from the screen buffer, the Line-by-Line Assembler keeps no copy of your source program. Longer programs will exceed the screen buffer, so towards the end of your program you will not be able to go back and view the beginning. If you happen to have a printer and/or disk drive, the Line-by-Line Assembler cannot use them. This means that you should keep a handwritten copy of your entire source program, at least until it is completely debugged.

The MAX Assembler

M.K. Eckhaus
P.O. Box 1079
Elgin, IL 60120
Cassette, $25.00

The MAX Assembler by M. K. Eckhaus uses a completely different approach. The MAX Assembler is actually a group of BASIC programs which run in the 16K of console memory. Only the output of the MAX Assembler (the machine code) is put in the Mini Memory.

The MAX Assembler consists of three BASIC programs and one data file. To use it, you first load the program ASM1 from tape using BASIC's OLD command. The first statement number in ASM1 is 4000, which leaves room at the front for you to add your Assembly Language source statements. You add your source statements using BASIC's editor. When they look just right, you RUN the program ASM1 to check the syntax. ASM1 reads the op code file which comes with the MAX Assembler and outputs an intermediate work tape. If ASM1 finds syntax errors, they are shown after it has finished parsing your whole program. If you have errors, you can edit your source program with BASIC's editor and run ASM1 again until it finds no errors. At this point you can SAVE ASM1 to a different tape with your source statements for later use. Next you load the program ASM2 from tape, again using BASIC's OLD command. When you RUN ASM2, the program will ask you to mount your work tape from ASM1; it uses this to build machine code in the Mini Memory. You will be asked to rewind this work tape once during ASM2 because it makes two passes. If you have a printer and want an assembler listing of your program, you must tell ASM2 about this and then RUN ASM3 afterwards, again using a (different) intermediate work tape for output from ASM2 and input to ASM3. If ASM2 finds any errors, it writes them to a work tape for viewing by ASM3.

The syntax of the source statements for this assembler varies significantly from 9900 Assembly Language. Since the source

Computer-Ed.
Of
Carmel, NY & Los Angeles, CA

99/4(A) Programs

- K-6 Reading
- K-6 Language Arts
- K-6 Math
  - Follow-up Games and Worksheets
  - Classroom Tested
  - Also Available for TRS-80 Level II

For
FREE Catalogue
Write To:

Computer-Ed.
1 Everett Rd.
Carmel, NY 10512

REALWARE

MARBLES HANG ON TO YOUR SHOOTERS. DON'T LOSE YOUR MARBLES. $14.95 XB

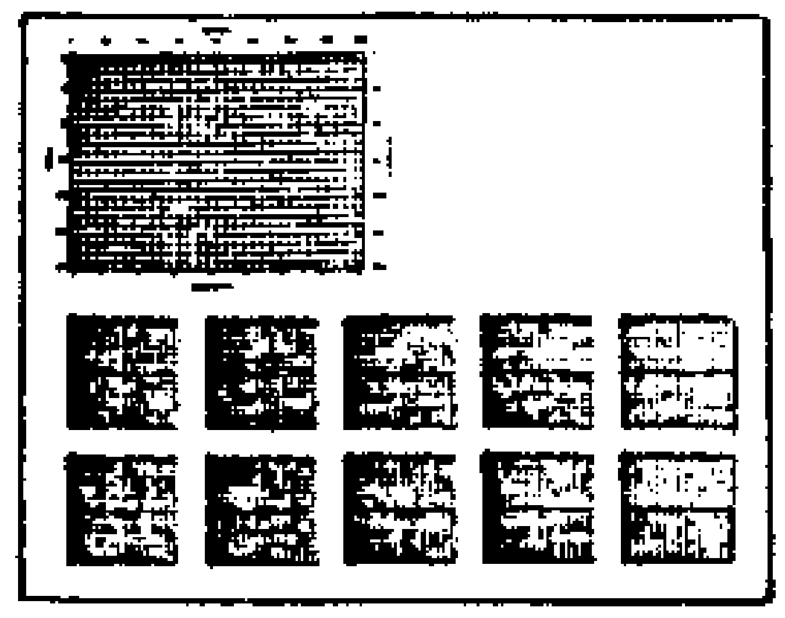
MASTERPEACE CREATE PATTERNS FOR FILET CROCHET, CROSS-STITCH EMBROIDERY, TILE & BEADWORK. FEATURING EVEN or UNEVEN ROWS (NETWORK BEADING) MULTICOLOR! PATTERN STORAGE. B and XB INSTRUCTIONS INCLUDED. $16.95

NEEDLEPOINTER YOU DESIGN... PROGRAM TRANSLATES DESIGN INTO A COLORFUL NEEDLEPOINT PATTERN. EASY DIRECTIONS. $16.95 XB

GRAPHICS LIBRARY REMOTE UTILITY HEX-DEF DESIGN, CHARS & SPRITES W/MAG. →←↑↓ CURSOR; SHOW/SAVE FOR PERM. STORAGE/INPUT TO YOUR PROGRAMS. $17.95 B & XB

GRAPHIC LAYOUTS 50pg. pads EACH W/SCREEN SHOWING ROW, COL, PIXEL # & 10 SPRITE/CHAR GRIDS, CODED FOR EASY HEX-CODE DEFINITION. $2.95

ESSENTIAL PROGRAMMING AID.



REALWARE
P.O. BOX 19428
AUSTIN, TX. 78760

ADD $1.60 EA. P./H.
ADD $2.00 EA. DISKETTE

Dealer Inquiries Invited

DISK DRIVES
NEW, SINGLE SIDED,
SINGLE OR DUAL DENSITY
INSERT DIRECTLY INTO
PERIPHERAL EXPANSION
BOX

$180.00
$170.00 ea/10

Limited Quantity

Check/money order/C.O.D.

Include $4.00/drive P & H

PRINTERS

Prowriter 8510.........call

Gorilla................call

Computer **P**eripherals **U**nlimited
P.O. Box 753
Brigham City, Utah 84302
(801) 734-2570

statements are part of the BASIC program ASM1, each statement must have a sequence number lower than 4000. Then you must have the word DATA with spaces both before and after it, because the statement will be input to ASM1 via a BASIC READ statement. After this comes the label (up to 6 characters), if any, followed by a space; you can use up to 108 such labels. If the statement has no label, you must enter # and a space. Next comes the op code. All 9900 op codes are supported, as are the assembler directives AORG, EQU, BSS, BES, BYTE, DATA, TEXT, DEF, REF, EVEN, and END. After this you put the operands, separated by periods. It may be hard for old programmers to remember to use periods, but commas are not allowed because they are meaningful to BASIC's READ command. The MAX Assembler has its own format for operands which, in the manual's words, "differs somewhat from TI operand syntax." At least superficially, the main difference seems to be that labels are preceded by the @ symbol. You must also precede all register operands with R (optional in 9900 Assembly Language). Finally, your statement may contain a comment preceded by at least one space. Figure 1B shows a portion of the MAX Assembler source statements for the sprite program. This assembler also has the names of the VDP utility commands built in, so you can just refer to such things as VMBW (VDP Multiple Byte Write) without having to define them.

The actual entry of the source statements is fairly fast, and the BASIC editor allows easy updating and scrolling throughout the source program. The MAX assembler is not interactive, so you don't see syntax errors right away; ASM1 lists up to 49 errors on the screen at the end. The statement numbers of the error messages can be cryptic—they refer to the actual sequence number of the statement in the source program, not to the BASIC number of the statement. The author suggests that you use BASIC line numbers starting with 10 and going up by 10, and use RES 10 after adding any source statements in between. This works fine; all you have to do is append a 0 to the line number in the error message to get the BASIC statement number.

Since the MAX Assembler resides in console RAM, you can theoretically use all 3808 free bytes in the Mini Memory for your machine code program. However, a single source program cannot usually make such a lengthy machine program. BASIC will most likely run out of memory (MEMORY FULL message) if you try to enter that many source statements at the beginning of ASM1. The manual that comes with the MAX assembler gives a rough estimate of 130 source statements per segment, and explains how to use the special CONT directive to hook together separately-created segments. It's hard to say what this source maximum is because it depends entirely upon the source statements being used. If you segment your program, each segment must be processed separately through ASM1 and ASM2 (and ASM3, if you want an assembler listing). You can have the MAX Assembler hook them together via the CONT directive, or you can make use of the REF and DEF commands which cause entries to be made in the Mini Memory's REF/DEF table. In this way, separate subroutines could be defined in one segment and called from another. The MAX Assembler's AORG allows you to locate the subroutines in different sections of the Mini Memory, but it's up to you to be sure they don't overlap. You can also use the DEF command to put the entry point of your program into the REF/DEF table for execution later. (When I used the DEF directive, I found that the MAX Assembler made a pefect REF/DEF table entry but did not adjust the LFAM properly; I did the latter with EASY BUG.)

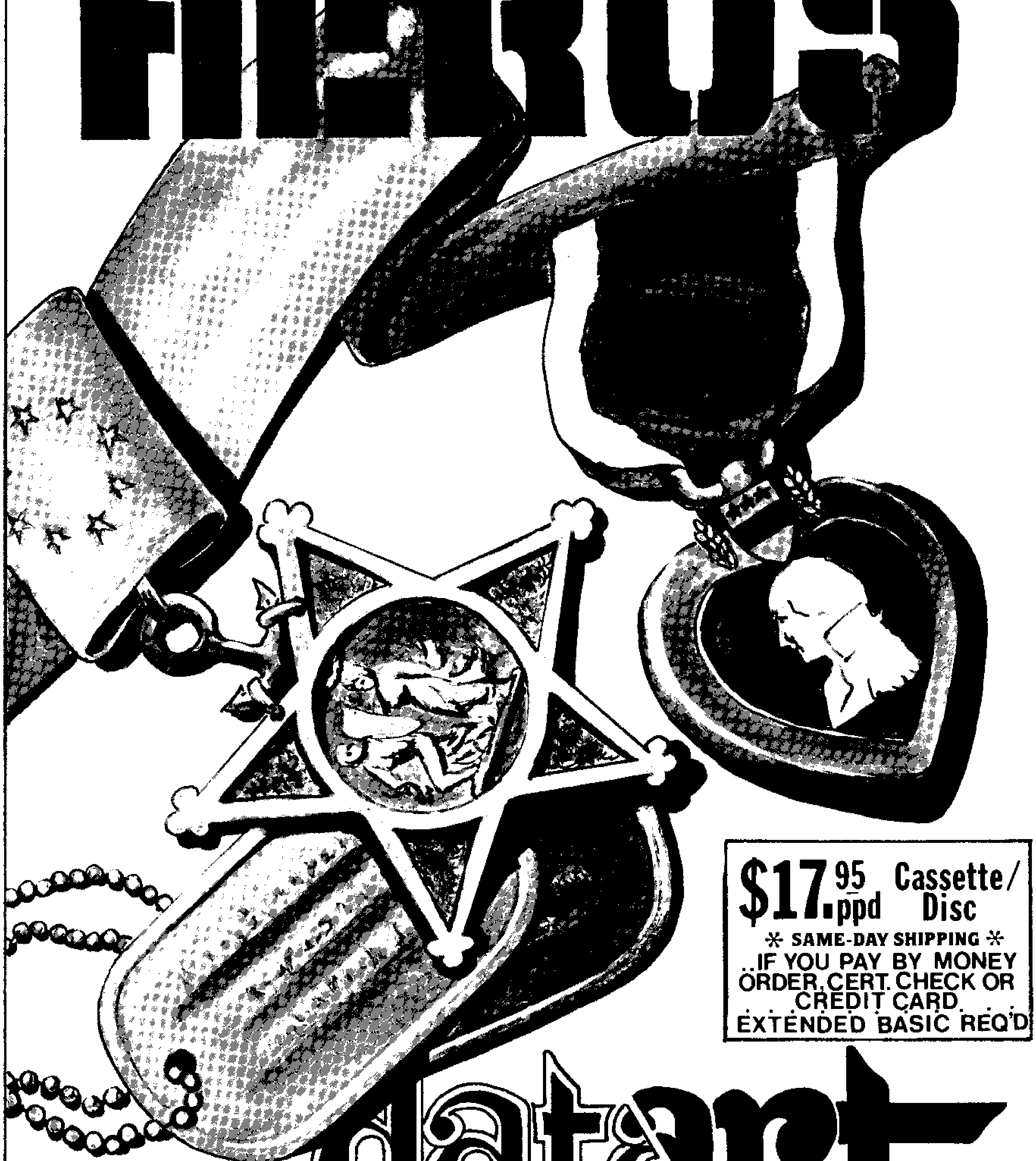
When it's time to change your program, you load the latest version of ASM1 with the program from tape. Make the changes with the BASIC editor, RESequence the program to start with statement 10, and run ASM1 again. You will also have to run at least ASM2 to reload the program into Mini Memory.

If you have a disk controller attached, you will have to turn if off to run ASM2. If you have a second cassette, you can

Continued on p. 28

INTRODUCING A FOUR·PART GRAPHIC ADVENTURE

HEROS



$17.95 ppd Cassette/ Disc

✲ SAME-DAY SHIPPING ✲

..IF YOU PAY BY MONEY ORDER, CERT. CHECK OR CREDIT CARD.

EXTENDED BASIC REQ'D

datart

SOFTWARE

1874 Union Road, West Seneca, NY 14224

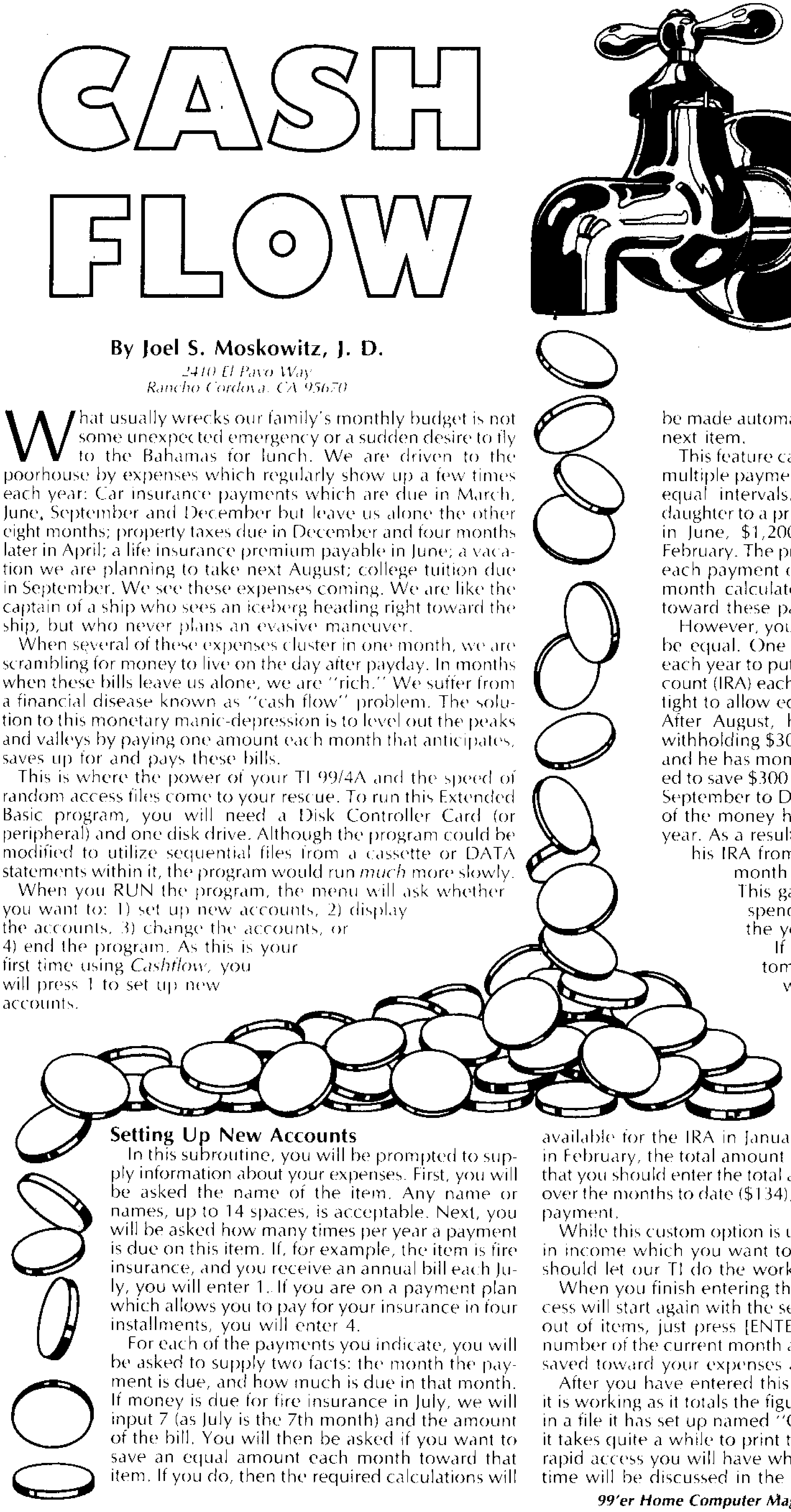
MasterCard VISA

ORDER BY PHONE

(716) 674·3408

Call collect for "Order Dept."

CASH FLOW



By Joel S. Moskowitz, J. D.

2410 El Pavo Way
Rancho Cordova, CA 95670

What usually wrecks our family's monthly budget is not some unexpected emergency or a sudden desire to fly to the Bahamas for lunch. We are driven to the poorhouse by expenses which regularly show up a few times each year: Car insurance payments which are due in March, June, September and December but leave us alone the other eight months; property taxes due in December and four months later in April; a life insurance premium payable in June; a vacation we are planning to take next August; college tuition due in September. We see these expenses coming. We are like the captain of a ship who sees an iceberg heading right toward the ship, but who never plans an evasive maneuver.

When several of these expenses cluster in one month, we are scrambling for money to live on the day after payday. In months when these bills leave us alone, we are "rich." We suffer from a financial disease known as "cash flow" problem. The solution to this monetary manic-depression is to level out the peaks and valleys by paying one amount each month that anticipates, saves up for and pays these bills.

This is where the power of your TI 99/4A and the speed of random access files come to your rescue. To run this Extended Basic program, you will need a Disk Controller Card (or peripheral) and one disk drive. Although the program could be modified to utilize sequential files from a cassette or DATA statements within it, the program would run *much* more slowly.

When you RUN the program, the menu will ask whether you want to: 1) set up new accounts, 2) display the accounts, 3) change the accounts, or 4) end the program. As this is your first time using *Cashflow*, you will press 1 to set up new accounts.

Setting Up New Accounts

In this subroutine, you will be prompted to supply information about your expenses. First, you will be asked the name of the item. Any name or names, up to 14 spaces, is acceptable. Next, you will be asked how many times per year a payment is due on this item. If, for example, the item is fire insurance, and you receive an annual bill each July, you will enter 1. If you are on a payment plan which allows you to pay for your insurance in four installments, you will enter 4.

For each of the payments you indicate, you will be asked to supply two facts: the month the payment is due, and how much is due in that month. If money is due for fire insurance in July, we will input 7 (as July is the 7th month) and the amount of the bill. You will then be asked if you want to save an equal amount each month toward that item. If you do, then the required calculations will be made automatically, and you can go on to the next item.

This feature can be a real timesaver if you have multiple payments of unequal amounts over unequal intervals. One family I know sends a daughter to a private school. They must pay $300 in June, $1,200 in September and $1,500 in February. The program automatically spreads out each payment over the year, and then for each month calculates how much should be saved toward these payments.

However, you might not want the payments to be equal. One neighbor wants to save $2,000 each year to put in an Individual Retirement Account (IRA) each December. But his budget is too tight to allow equal monthly payments of $167. After August, however, Social Security stops withholding $300 from each month's paycheck, and he has money left over. He therefore decided to save $300 toward his IRA each month from September to December, and to spread the rest of the money he needs to save over the entire year. As a result, he saved $67 a month toward his IRA from January to August and $367 a month for the remaining four months. This gave him an extra $100 a month spending money for eight months of the year.

If you want to devise such a custom plan, indicate that you do not want the level payments option. The program will then display the months of the year in sequence and ask how much you wish to have saved toward that bill by each month. In our example, $67 will be available for the IRA in January. When another $67 is added in February, the total amount accumulated will be $134. Note that you should enter the total amount accumulated for this item over the months to date ($134), and not just the current month's payment.

While this custom option is useful if you have periodic surges in income which you want to level out, for the most part we should let our TI do the work and opt for level payments.

When you finish entering the data for the first item, the process will start again with the second item. When you have run out of items, just press [ENTER]. You will then be asked the number of the current month and how much you have already saved toward your expenses as of this month.

After you have entered this data, the computer signals that it is working as it totals the figures and prints them to your disk in a file it has set up named "CASHDATA." You will note that it takes quite a while to print this data, as opposed to the very rapid access you will have when you use it. This allocation of time will be discussed in the programming tips later.

USERS GROUP • QUALITY

WHY PAY MORE? JOIN OUR

THE 99/4A PROGRAM EXCHANGE
INTERNATIONAL USERS GROUP

The 99/4A PROGRAM EXCHANGE, INC. is an international users group specializing in the distribution of owner/user written software. We are the lowest cost software organization for 99/4A owners in the world. Our purpose is to bring a tremendous range of quality software written by owners/users to 99/4A owners at the lowest possible cost.

PROGRAMS ONLY $2 EACH

REASONS TO JOIN

★ **ONE-TIME MEMBERSHIP FEE**
The 99/4A Program Exchange has a low ONE-TIME membership fee of only $10.00. What's more, we'll mail out membership materials **the very same day** that we receive your membership fee!

★ **INCREDIBLY LOW PRICES**
Members may purchase ANY PROGRAM from our owner/user written software catalog for ONLY $2.00 per program - no tricks, no gimmicks! Programs available on CASSETTE or DISKETTE.

★ **QUALITY AND DIVERSITY**
Our software library currently has over 1000 programs for 99/4A users! Programs are categorized as follows: GAMES, DEMONSTRATIONS, EDUCATION, BUSINESS, HOME, APPLICATION and UTILITY!

★ **LITERATURE**
The 99/4A Program Exchange publishes highly informative newsletters containing hints, program reviews, problem solvers and much more.

★ **SOMETHING FOR EVERYONE**
There is no programming experience required to join. However, if you do program and want to submit a program to our software library, we have a generous 5 for 1 program exchange! We even accept MASTERCARD and VISA.

I understand that I will receive the 99/4A Program Exchange, Inc. software catalog containing quality programs for $2 per program, a current newsletter and an official software order-form.
Send your $10.00 Membership Fee.
☐CHECK OR MONEY ORDER ☐VISA or MASTERCARD
Name:____________________
Address:____________________
City/State ____________ Zip ________
Card #____________ Exp:________
THE 99/4A PROGRAM EXCHANGE
P.O. BOX 3242, TORRANCE, CA 90510

If you have made a mistake entering any items, don't worry. The data will be very easy to alter later. But before we consider how to change the data we have entered, we will look at how we use it in the Display subroutine.

Display Accounts

When you select this subroutine from the menu, the left side of your screen displays a list of all the expense items you have entered. You are then asked to input the number of the month you wish to examine (or to input 0 if you want to return to the menu). To see your situation in January, for example, enter 1. The name of the month will appear at the top of the screen. Next to each item, you will see the total amount you want to have set aside as of January to pay bills on that item. If any bill is actually payable in January, the amount of the expected bill will be displayed on the right side of the screen as a negative number in parentheses. The amount will be paid out of the total saved.

At the bottom of the screen your situation is summarized. First, the total amount you are supposed to have accumulated for all items is displayed. If you have not saved anything toward your expenses in prior months and if no bills are payable out of this total in January, this is the amount you would have to pay into your account to stay on track.

Usually, however, you will have saved something toward this total as of the end of the previous month. The amount of these savings is displayed next. Under that, the total amount of all expenses due in January is set forth. On the last line is the amount of the payment which you have to make in January to get ready for the next month.

For example, suppose the bottom four lines of the screen look like this:

TOTAL	2500
– SAVINGS	1800
– EXPENSES	400
PAYMENT	300

This tells you that the total amount you need to have accumulated before paying any expenses is $2500. You have been saving toward this amount over the previous months, however, and after your last payment you have accumulated $1800. Moreover, $400 in bills due this month will be taken out of this total. The actions you will take this month are to 1) pay the $400 in expenses and 2) pay $300 into the savings account toward next month's needs. Between your expenses and your payment to savings, your total outlay is $700, which represents your "level payment."

Occasionally, the PAYMENT figure is a negative number, as in the following example:

TOTAL	2500
– SAVINGS	1800
– EXPENSES	900
PAYMENT	–200

In this case, the two actions you will take are to 1) pay the $900 in bills as itemized and 2) *withdraw* $200 from your savings to help you pay the bills. Again, your net "level payment" is $700.

Changing the Accounts

There are various reasons why you might want to alter your accounts: Your auto insurance rates just went up; your child just graduated from college, and you no longer have to save for his tuition; you have decided to go to Europe next August, and you need to save $3000 for the trip. Whatever the change, when you select Change Accounts from the menu, you will see your expense items as well as PRESENT MONTH/SAVINGS displayed on the screen. The needed data will then be read from the disk.

You will have the options to 1) alter items, 2) enter new items, 3) delete items or 4) indicate that your changes are completed.

Deleting an item is easy. Just select this option and enter the number of the item you want to delete. If you indicate that you want to add items, the program will take you back to the prompts you originally used to input your data. If the screen indicates FILES FILLED you will be able to add new items only if you first delete items to make room and then print this shorter list to the disk.

If you indicate that you want to alter an item, the screen will display all of the data pertaining to that item, including its name, the month and the amount of each payment, and the amount accumulated towards these payments for each month. You can alter any of these items. Unless you merely want to change the name of the item or are altering a "custom" account, the easiest way to alter an item is to delete it from the list and add it again as a new item.

When you signal that your changes are completed, the new totals will be computed and the new data will be printed to the disk, ready to display.

Practical Pointers

While *Cashflow* will make your financial life much more tranquil, it is a whole new orientation to paying your bills, and you should ease into it slowly if you want it to work. The most practical method, and the one which I used, is to ease into *Cashflow* over the period of a year. Each month, after a bill is paid, add it to your program so that you can begin to save for its reappearance the following year. If too many payments are due in the same month to make this practical, add only some of the items to your list and save the rest for next year.

One other major benefit of *Cashflow* should not escape your notice. You will be earning *interest* on all that money you set aside. The actual amount in your account will therefore be greater than the required savings displayed in the program. While the program could easily have taken account of this interest to reduce your payments a bit, the purpose of ignoring interest is to give you a margin of safety when some of the bills are higher than you expected. If inflation and taxes don't gobble up your surplus, then throw a party to reward yourself for your discipline, or reward your TI-99/4A with some new software.

If, however, things are so tight that you cannot afford a margin of safety, you can discount the interest in advance in favor of lower payments by using my program *Savings* in the April, 1983 *99'er HCM*. Use the "level payments" subroutine to figure out the amount of monthly payment that will, when added to your interest, equal the amount of your bill at the end of a year. You can then multiply this figure by 12 and feed the result into the level payments option of this program.

Programming Pointers

The major advantage of random access files over sequential files is speed of input. Rather than having to read all of the data in the file, you can proceed directly to the record containing the informatin you want.

In reading data on a disk, the computer consumes more time in locating the data and relatively less time in reading it. It is as though you lived in a summer cabin and had to haul your water from a well 50 yards away. Most of your time would be spent in transit to and from the well. If you carried two buckets, instead of one, you could haul the water you needed in a much shorter time. In setting up your files, you will want to put as much data on each record as is practical and arrange the data in the order in which you will use it.

In the file in this program, the names of all of the expense items are contained in Record 0. When you select the Display subroutine, only one record will have to be read to input all of these names, and they will therefore be rapidly displayed on the screen. If these names were located on different records, the operation of the program would be much slower.

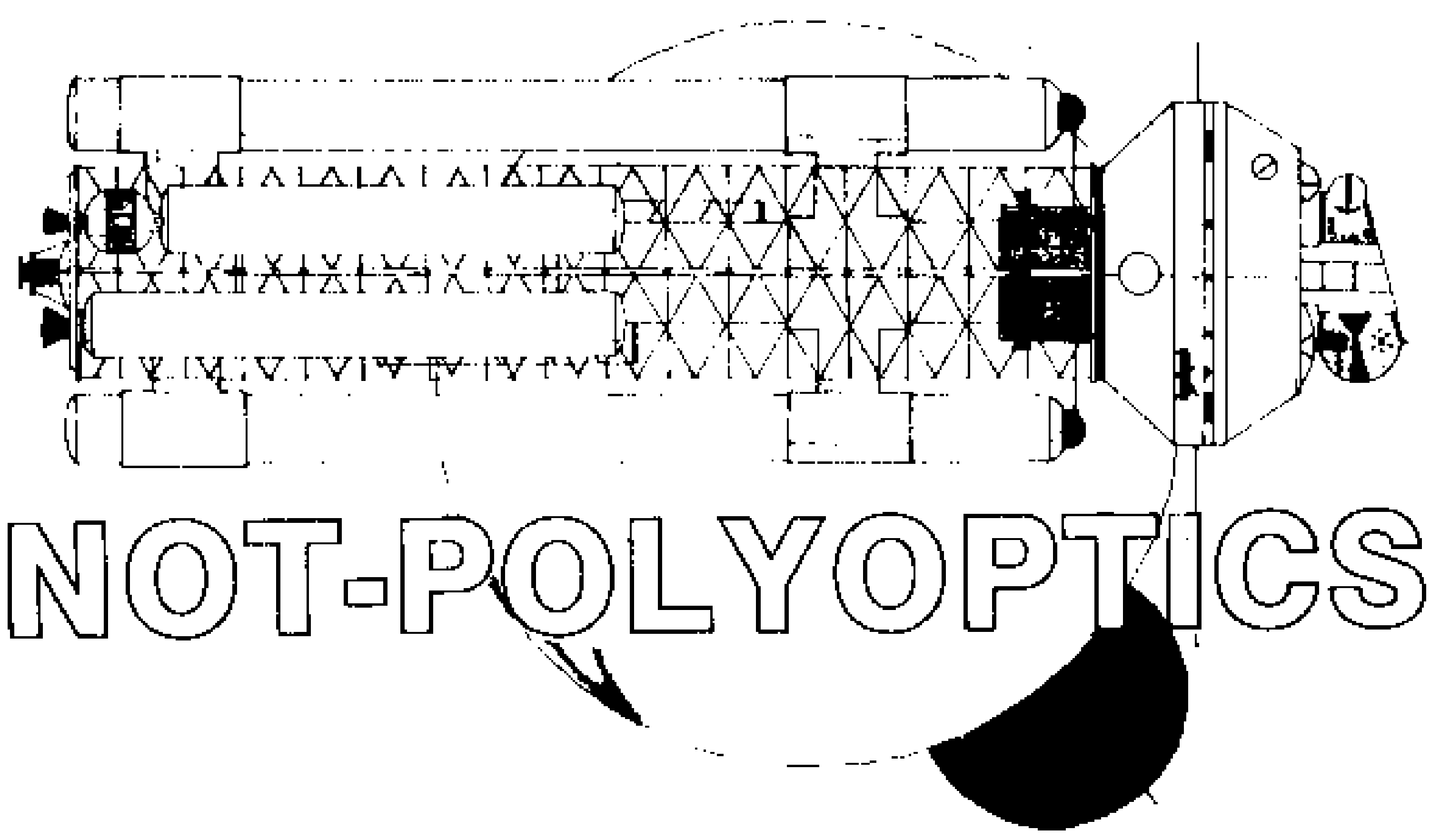
On the same principle, all of the display data pertaining to each month, with the exception of itemized expenses, are contained on the same record.

That explains why the names of the expense items are 14 letters and spaces long, rather then 15. The program utilizes a maximum of 16 items. Only 15 strings fit on a record of maximum length if those strings are 15 letters and spaces long. But if the strings are 14 letters and spaces long, 17 of them can fit on a record. This leaves room at the beginning of the record for a notation as to how many items there are.

While speed in display requires that the data be arranged by month, speed in changing the data requires that it be arranged by item. The data is therefore arranged on the file in both ways. When you indicate that you want to alter data, not all of the file is read in, only the minimum data about the expense items. Displaying some of the data in two forms of organization increases disk space and printing time, but you are compensated by speed of use.

The only thing faster than reading records efficiently is not having to read them at all. Therefore, when you display the figures for a given month, the value of a variable (U(M)) changes from 0 to 1. If you later want to display that month again, the data will be read from the disk only if the value of U(M) is 0.

Continued on p. 26



Five New Games for the 99/4(A)

In TI Console Basic -

Treasure Trap An exciting new concept in graphic adventure. Break into the Builders' Planetoid and explore myriad rooms on your quest for High Tech treasure. A different adventure each time you play!

99'vaders All the finger-slamming adrenalin of the arcade favorite at half the cost. Fight back wave after wave of galactic kamikaze aliens from the last outpost on Earth.

In TI Extended Basic -

Laser Tank On a battlefield of the future maneuver your Coherent Infra-red Equipped Vehicle (CIREV) into position for the lightning quick laser duels with similarly equipped enemy tanks. Chase and engage in the battle zone.

Waldoball Androids are pitted against Robots in this soccer game of tomorrow. Combines the action of team sport with the machine cool of pinball.

Arcade Monopoly Play this all time favorite with full graphic representation on your screen. Choose between regular and arcade versions. The arcade game adds quick movement, rolling obstacles, and the ability to blitz opponents' properties with super projectiles.

And don't forget the games that made NOT-POLYOPTICS: Great strategic games such as Khe Sanh, Sengoku Jidai, Ant Wars, Shipsl, and Hordes. Great action games like Tickworld, Maze of Ariel, and Cars & Carcasses 2. Great board games like Addvance and Crosses. And of course the best selling Winging It flight simulator and Starship Pegasus game of CETI.

A New Peripheral that will change how you interact with your computer!

The Texas Light Shooter A photoreceptor gun that plugs into the joystick port of your 99/4(A) to allow you to shoot at targets on the screen. Included with the Light Shooter are complete instructions and a shooting spree game on cassette. Our supply will be limited initially so hurry ordering this item.

NOT-POLYOPTICS
13721 LYNN STREET, SUITE 15
WOODBRIDGE, VIRGINIA 22191
☎(703) 491-5543

NAME____________________
ADDRESS____________________

$18.00
☐ Starship Pegasus ☐ Khe Sanh ☐ Sengoku Jidai ☐ Hordes ☐ Ant Wars
$15.00
☐ Laser Tank ☐ 99'vaders ☐ Arcade Monopoly ☐ Shipsl ☐ Winging It
$13.00
☐ Treasure Trap ☐ Waldoball ☐ Maze of Ariel ☐ Tickworld ☐ Addvance
$10.00
☐ Crosses ☐ Cars & Carcasses 2
☐ Texas Light Gun $30.00
10% discount on orders of $20 or more. Total of Order______
Virginia Residents add 4% sales tax.
$1.00 Shipping for Light Gun.
©1983 by Not-Polyoptics.

KEY STROKES FOR THRIFTY FOLKS

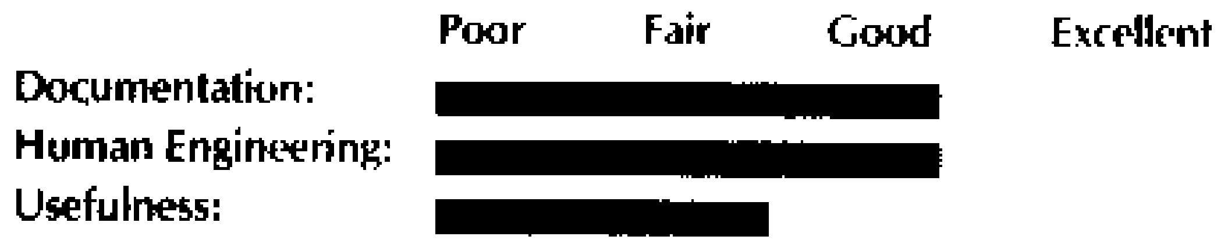
A Review of *Typwriter*

By Walter Hego

Contributing Editor

Name: Typwriter
Program Type: Word Processor
Language: Extended BASIC
Distributor: Extended Software Company
11987 Cedarcreek Drive
Cincinnati, OH 45240
Price: $32.00 cassette
$35.00 diskette

System Requirements:
Extended BASIC
cassette recorder



The price of word processing is dropping so rapidly, it's hard to keep up with it. Printers are turning up at prices that appeared impossible just a short while ago; this puts word processing hardware within reach of a good many Home Computer owners for whom it was once just a pipe dream. These people will now be looking around for inexpensive word processing software to complete their systems.

Typwriter, a software package from Extended Software, may be precisely what they're looking for. This program allows you to enter text into the computer, then save, recall, edit or print that text. It also provides a number of simple commands which can be inserted directly into the text to control the format of the final, printed product.

Usefulness

Typwriter comes on either cassette or diskette and is written in Extended BASIC. Although the minimal system limits you to about 600 words of text input at a time (120 lines of text, each line about 5 words long), you can perform an extremely simple conversion which approximately doubles the available text buffer space if you have a memory expansion peripheral card.

Typwriter does not necessarily limit you to short, 600-word documents. Its formating commands let you form longer texts by chaining short documents together. When the command @A appears at the end of a text file followed by another file name, *Typwriter* finds that file and prints it immediately following the file it has just printed. Thus, if you have limited memory space available, you can SAVE documents in sections.

If you need to generate repeated copies of a given document, you can use the @A command followed by a space and the letter R (@A R) to print as many repetitions of the document as necessary. The PROMPT command (@P) lets you generate "customized" boilerplate documents. If the printer will accept software control codes, the @S command can direct the printer to implement those options. Several other formating commands allow simple formating of text as it is being printed.

Entering and editing the text you want to print is straightforward—with one exception. *Typwriter*'s text lines are short, and there is no warning before you hit the margin. When I was using it to write this review, I often found myself typing over characters at the end of a line. Although the manual contends that "you can get used to typing lines of about 20 characters and pressing the ENTER key without looking at the screen," that is a procedure I have yet to master. It is especially irritating when a long word, like "straightforward," falls at the end of a line. Is there room—or isn't there?

Those of you who program in BASIC will find *Typwriter*'s editing functions very familiar. Even if you're not a BASIC programmer, it shouldn't take you long to become familiar with all the commands. When you start out, however, you need to know that you can enter and exit the Edit mode only if the cursor is in or at the left margin.

Documentation

Typwriter's documentation is quite clear. It covers all the instructions and gives examples when appropriate. The instructions for changing the underlying BASIC code to take advantage of memory expansion devices should be sufficiently clear for even the most timid and computerphobic nonprogrammer. The manual, which is concise and follows the main menu screen, makes it easy to find the information you need and to relate the text to program use. The section on getting started gives novice users a guide to follow, some general hints, and the reassurance that punching the wrong keys as they learn won't cause the computer to go up in smoke.

The manual requires some editing in places—the spelling errors are particularly disconcerting in a word processing manual. In addition, the sections on the DROP and JUSTIFICATION commands are a little mystifying. But some experimentation will make their use clear.

Human Engineering

Typwriter provides easy access to all the features of the system. Most users will quickly become familiar with all twelve formating and nine editing commands and probably won't need to refer to the manual for help. At every step the menus give clear prompts to direct the user. *Typwriter*, in its disk-based form, takes advantage of one of the nicest features of Extended BASIC: It loads itself automatically. When the text you've entered reaches the storage capacity of your system, however, you get a cryptic error message:

```
CODE = 57
JUST ENCOUNTERED AN ERROR.
```

The screen will direct you to the Extended BASIC manual, where you will read another puzzling message. Rather than merely giving you an error message when you hit the limit of text, the program would be much more helpful if it prevented you from entering any more text, and gave you a message that memory was full and you should now SAVE your text.

Not all users can readily take advantage of many of the program's features. Those who have cassette-based systems may be able to use some of the boilerplate features in the formating commands, but this will require careful planning, and a lot more jockeying around of cassettes.

And there are a number of things you wouldn't want to try with *Typwriter*. This program's short line length would make it very difficult to set up tables, for instance. Any word processing jobs which require heavy editing, movement of blocks of text, and extensive insertions would also best be done with other software. This is not to say you *couldn't* do it—you can shave with a Bowie knife, after all, but. . .

So if you're looking for low-cost software for a relatively small volume of word processing—software which does what it says it will—*Typwriter* may be for you.

SOFTWARE FOR THE 99/4(A)

New MASTER DISK FILE New

A master index of your disks.

MASTER DISK FILE uses a large portion of the 90K bytes available on a single sided disk as virtual memory to create and store a perpetual file of disks, programs and applicable data. Data can be added, removed or up-dated. The file may then be accessed for viewing on the screen or for printing several types of lists on a printer.

Insert disk into drive, it is catalogued then can be filed.

Reads up to 95 programs and files per disk.

Maximum of 120 disks or 1100 programs may be filed.

Does not require memory expansion.

Supports single or double sided disks (or mixed).

Supports single or multiple drives.

Programs are catalogued from disk in order and merged into the file; no sort is required after filing.

SEARCH for disks or programs by name.

Look-up time from a cold start: under one minute; from a running program: 15 to 25 seconds!

List on screen or a printer in alphabetical order by program name or disk name.

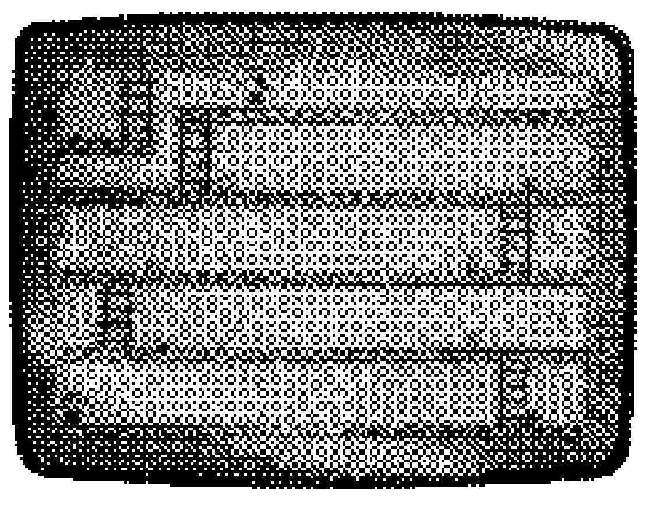
Up-date disks that have been changed by inserting into drive. Automatically replaces and up-dates old information.

May be used without a printer (on screen); file is portable and can be taken to a friend's for printing.

Supports any printer: serial or parallel.

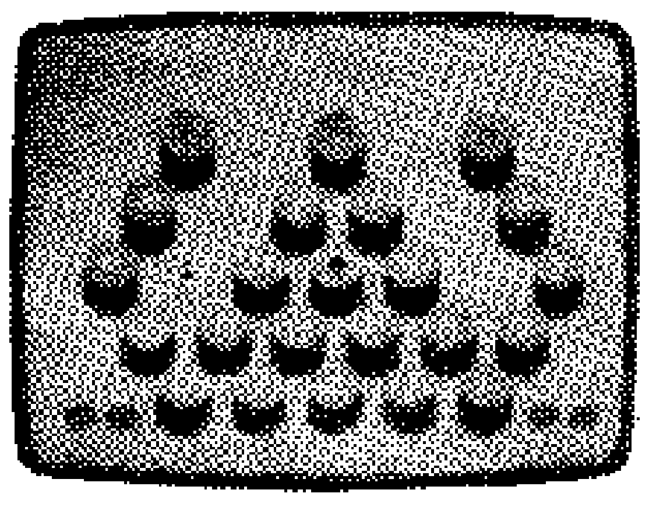
Diskette (only) $15.00

GAMES PAK/III



KONG

Help KONG fight his way to the top of the warehouse, avoiding rolling barrels and trap-doors. Save Roxanne from the bomb set in motion toward her by the villainous Igor. Six different screens. Joysticks.
Cassette or Diskette $15.00



BOUNCER

BOUNCER bounds from one trampoline to another, scoring points for clearing off the squares. He must avoid the arrows which will burst him. Six different screens. Uniquely coordinated sprites, graphics and sounds make BOUNCER so like a real arcade game, you will wonder why we didn't provide a slot for the quarters. Joysticks required.
Cassette or Diskette $15.00

ROMEO

ROMEO has a goal. But he must traverse the blazing desert dunes, swim a stream infested with alligators and sharks, and bolt through treacherous terrain for his just reward. Enough action to wear out a set of joysticks!
Cassette or Diskette $15.00

Dealer and programmer inquiries welcome.

TYPWRITER

A 16K WORD PROCESSOR
on Cassette or Disk

Any Input/Output storage of text — disk, cassette, cassette input/disk output, or vice versa.

Selectable *right justify.*

Complete text *Editing* — by cursor control; including insert & delete lines, partial print, printer halt or abort without text loss, page FWD & BKWD, and more.

Complete *Software Control* of Printer (depending upon its capabilities) — for enhanced print, underlining, formatting, 28 to 254 characters per print line, etc.

No Special Equipment — monitor, console, Extended Basic module, C or D, printer.

Comes with a 20 page instruction booklet.
Cassette $32.00 Diskette $35.00

GAMES PAK/II

ARTILLERY

The opposing force must be destroyed by determining angle and force of each shot. An ever-changing wind complicates matters. Play is between two players or one player against the computer. Simulates actual ballistic trajectories.
Cassette or Diskette $9.95

DE-CYPHER

An encrypted message is displayed and guesses change all corresponding letters to the guess. Includes a help feature. Comes with 50 messages which can be changed.
Cassette or Diskette $9.95

PUZZLE 15

Move alphabetic squares (A to O) into the single empty slot in an effort to arrange them into order. The computer keeps track of the number of moves taken to solve the puzzle and scores of previous games are displayed for comparison. Multiple squares may be moved when appropriate.
Cassette or Diskette $9.95

FLIP CHECKERS

Outsmart the computer or an opponent by getting all checkers flipped to your color. Computer determines its moves pleasingly fast. A board game with no pieces to lose. Joysticks required.
Cassette or Diskette $9.95

SCREEN/DUMP

Print the screen to a dot-matrix printer. Does not require extra memory! Disk version is simple to use. Cassette version requires mild programming knowledge.
Cassette or Diskette $12.00

NAME-IT

DATA BASE for: Mail Lists, Labels, Files

Records: 250 records per diskette consisting of up to nine 28-character items per record.

Prompts: user designated prompts.

Complete *File Sort:* 250 records in *100 Seconds.*

Search; Pre-set; print labels & lists.

Includes a FORM LETTER program that uses NAME-IT data in TYPWRITER generated form letters.

Cassette version differs from disk version.
Cassette $32.00 Diskette $35.00

NOTE: Should you decide to up-grade to the TI-WRITER module, TYPWRITER and NAME-IT data can be converted for use by that module. NAME-IT alone, will generate 250 TI-WRITER form letter records.

TI-WRITER is copyrighted software of Texas Instr.

GAMES PAK/I

FROGGY

Jump FROGGY across 10 lanes of traffic then across 6 logs; keyboard or joysticks. Fabulous sprite action!
Cassette or Diskette $9.95

EXTENDED BASEBALL

Joystick control of the pitcher and the batter, and individual batting averages that specifically effect the batting algorithm. Multi-base and multi-runner plays. Joysticks required.
Cassette or Diskette $9.95

GORFIA PESTULITIS

Joystick control of a laser sight or inertia influenced space mines to shoot down the invading Gorfians. Joysticks required.
Cassette or Diskette $9.95

EXTENDED HANGMAN

Quick graphics, music, color, speech (optional) and sound are added to keep the players entertained. Includes 580 words of 4 to 9 letters in length in easy, medium, and difficult groups.
Cassette or Diskette $9.95

TIC-TAC-TOE

Quick set-up and quick decision making at four levels of difficulty. The levels avoid the frustration of the novice never having a chance to win, while the most difficult level will challenge the pros.
Cassette or Diskette $9.95

A detailed catalog is available free. Circle "FREE" on the order form or send a letter or postcard.

E X T E N D E D

ORDER FORM

EXTENDED BASIC MODULE REQUIRED FOR ALL PROGRAMS

		CATALOG	$ FREE
GAMES PAK/I	$26.95	(C or D)	$
(Froggy, Extended Baseball, Gorfia Pestulitis, Extended Hangman, Tic-Tac-Toe)			
GAMES PAK/II (Artillery, De-Cypher, Puzzle 15, Flip Checkers)	$26.95	(C or D)	$
GAMES PAK/III (Kong, Bouncer, Romeo)	$26.95	(C or D)	$
TYPWRITER (word processor)	$32.00	(C price)	$
	$35.00	(D price)	$
NAME-IT (data base/mail list)	$32.00	(C price)	$
	$35.00	(D price)	$
SCREEN/DUMP (printer required)	$12.00	(C or D)	$
MASTER DISK FILE	$15.00	(D only)	$

INDIVIDUAL GAMES: (C or D)

☐ Froggy
☐ Tic-Tac-Toe
☐ Extended Baseball
☐ Artillery
☐ Gorfia Pestulitis
☐ De-Cypher
☐ Extended Hangman
☐ Puzzle 15
☐ Bouncer
☐ Romeo
☐ Kong
☐ Flip Checkers

Send this form or a substitute with check or money order to:

Extended Software Company
11987 Cedarcreek Drive
Cincinnati, Ohio 45240
(513) 825-6645

SATISFACTION GUARANTEED
IF YOU ARE NOT COMPLETELY SATISFIED, YOU MAY RETURN THE PROGRAMS (and instructions) WITHIN 15 DAYS FOR A FULL REFUND OF YOUR PURCHASE PRICE.

Total Individual Games:	$
Shipping & Handling (1st Class Mail):	Included
Sales Tax:	Included
Add $2.00 if C.O.D. (U.S. Mail Only):	$
Check or money order or C.O.D Total:	$

Cut Here (may be copied or substituted)

TI
DEALERS

Anyone can ship your product
It's SUPPORT that makes the difference

Get the

COMPUTECH Connection

Call *COMPUTECH DISTRIBUTING.* One convenient
toll–free phone call gets you instant access
to our huge inventory of computer products
for the **Texas Instruments Home Computer.**
Plus over 1400 other TI–related items.

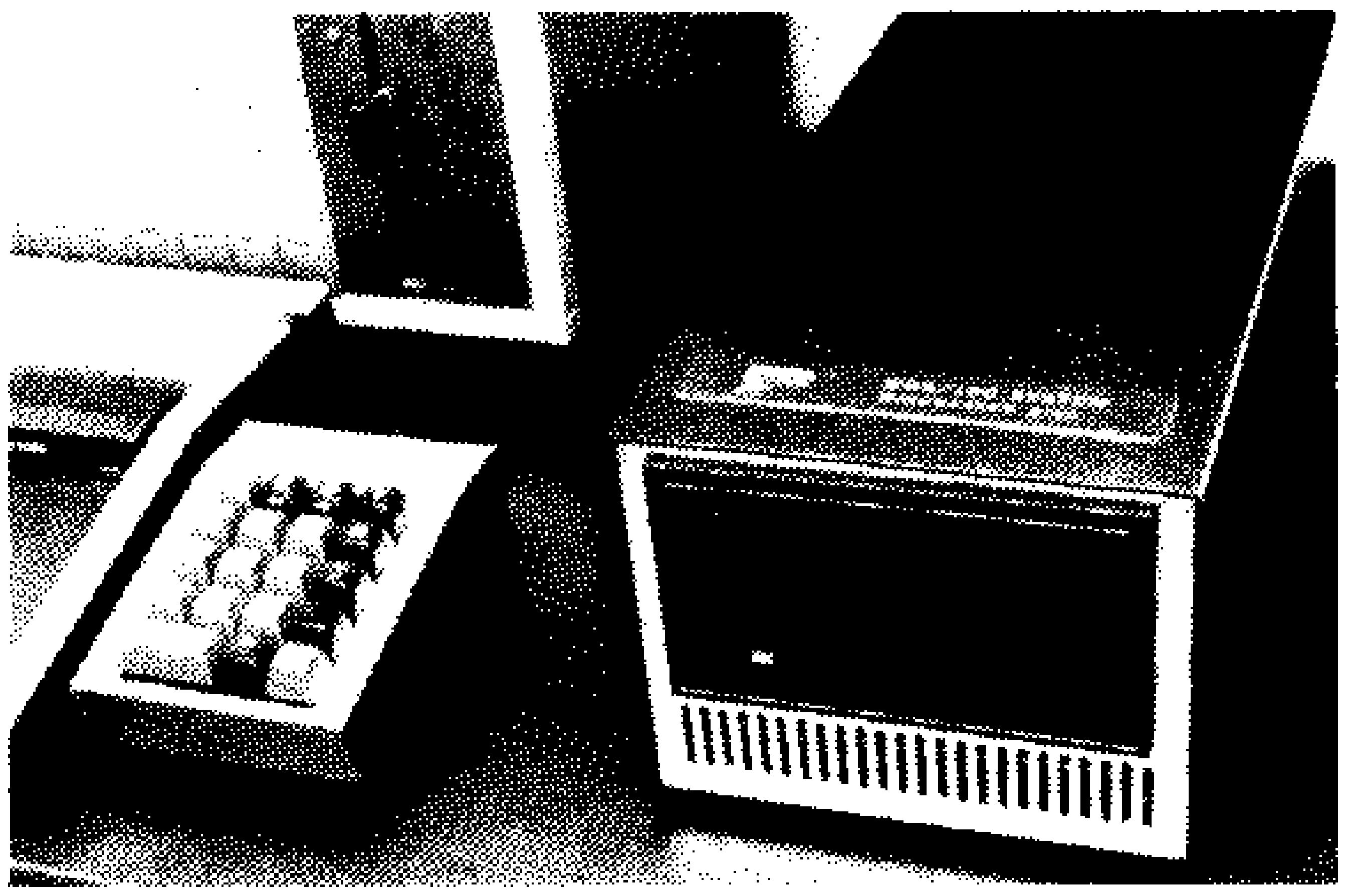
Try *COMPUTECH DISTRIBUTING*—call our
dealer service center to request your
information–packed **dealer kit** today:
1–800–641–5000 (in Missouri 1–800–492–4500)

COMPUTECH DISTRIBUTING
209 E. WALNUT SPRINGFIELD, MO 65805
1-800-641-5000 (In Missouri 1-800-492-4500)

NOW SHOWING

THE MYARC WINCHESTER DISK AND CONTROLLER SYSTEM

Available for TI-99/4A in 5 or 10 megabyte models



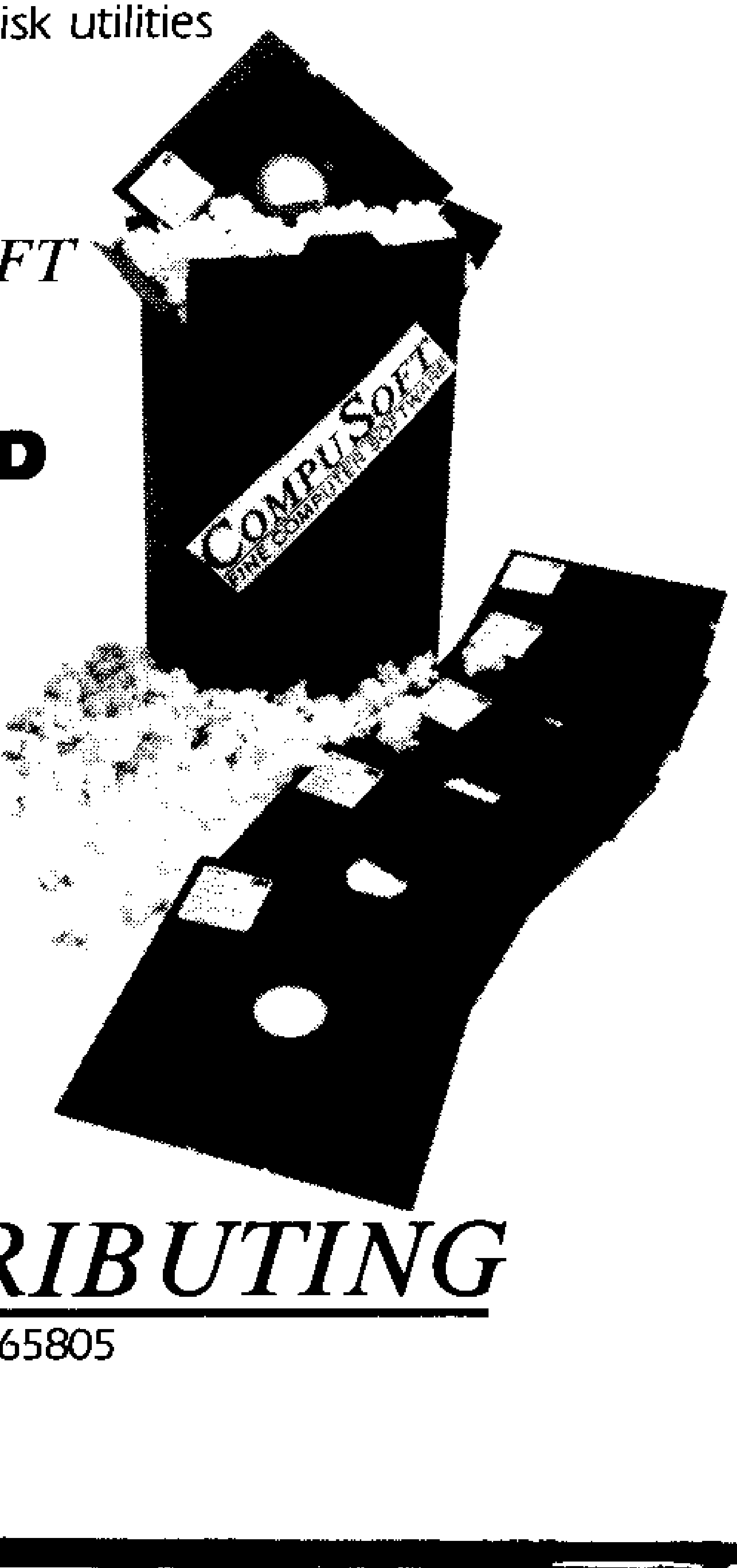
DEALER INQUIRIES INVITED

- ☐ Customized "directory" management
- ☐ Reliable back up
- ☐ Easy installation
- ☐ TI extended basic and assembly language support
- ☐ State of the art ecc
- ☐ Complete array of disk utilities

ALSO STARRING

Our CUSTOM DESIGNED *CompuSoft*
BUSINESS SOFTWARE
and
THE NUMERIC DATA ENTRY PAD
SPEEDKEY

It works Exclusively With *CompuSoft* **Software**



COMING ATTRACTIONS

- ☐ Accounts receivable!
- ☐ Word processing!
- ☐ Accounts payable!
- ☐ Agricultural!
- ☐ 1040 tax system!
- ☐ Mailing list!
- ☐ General ledger!
- ☐ Inventory!
- ☐ Order entry!

Dealer Inquiries Invited

Distributed Exclusively By

CompuTech DISTRIBUTING

209 E. WALNUT SPRINGFIELD, MO 65805

ultra — software
for the TI-99/4(A)

ARCADE STYLE GAMES

Cobra Command

Assembly language! Pilot a super-hot Cobra Helicopter over rough terrain where you battle Heavy's, Nemats and Sorex Fighters. Neutralize the heavily-armed Hordon Bunkers and land to rescue your people. **MMM $19.95**

EGGBERT

Assembly language! Bounce Egg-Bert around the pyramid of 3-D cubes. Change all the cubes to a new color before the leaping enemies catch Egg-Bert. Fabulous graphics, sound and fun. **MMM $19.95**

PULSAR

Command a fleet of Robot Mining Vessels in Megidon Sector where you confront the most hazardous Pulsars in the Galaxy. Mine Terellium Ore and survive the terrors of all ten Pulsar Systems. Speech optional. **X-BASIC $14.95**

Sky Baron

Pilot your vintage Curtiss JN-4 Biplane cross-country in spectacular aerial graphics. Rescue paratroopers and land at refueling airstrips while avoiding storms and enemy aircraft. **X-BASIC $14.95**

PROFESSIONAL UTILITIES

MMM EDIT·ASSMBLR Buy this Editor/Assembler combo and say goodbye to the "Line-by-Line Blues." Powerful, easy-to-learn editor allows you to save your source code for easy modification. Enhanced symbolic assembler includes several features not found in the Line-by-Line Assembler. **Features:** • Save/Restore from one or two cassette drives • Allows programming of all 4K of MMM • Over 20 edit commands • Allows merging of separate programs in whole or by parts • 10 assembler directives including DEF & TEXT • "Pre-loaded" symbol table contains addresses for all MMM ROM routines • **SPECIAL BONUS:** Includes dis-assembler for decoding other programs or ROM routines.

Requires **Cassette** plus **MMM** and/or **X-BASIC W/32K** **$24.95**

ON GAMING

Takes all the guesswork out of game development. Includes a comprehensive manual and a powerful graphics Editor. From Algorithms to Sprites, it will reveal the gaming secrets and tricks professionals use. **X-BASIC $19.95**

c.a.root
associates
suite B109
32700 pacific hwy. so.
federal way, wa 98003

- Send us $2.00 and we'll send you our Brochure-on-Tape, a "hands-off" demo of our software. (X-BASIC)
- All prices are for cassette, add $2.00 for diskette version
- All games and "On Gaming" require joysticks
- Washington State residents add 7.6% sales tax
- **Visa** and **Mastercharge** welcome · no surcharge
- **DEALER INQUIRIES INVITED**

c.a.root

Want to Get Published?

99'er Home Computer Magazine is looking for articles in all areas of interest that concern Texas Instruments personal computers. Here are the kinds of articles that we want you to write for us:

- Are you a businessman, professional, hobbyist, scientist, or engineer with an interesting microcomputer application? Tell us how it works, what problems you've had to overcome, and what recommendations you have for others. We're especially interested in sharing user-written software with our readers.
- Have you recently purchased a piece of hardware or software that hasn't quite come up to your expectations, or has, on the other hand, impressed you with its performance? We're looking for comprehensive product and book reviews from different perspectives.
- Are you an educator or parent with something to contribute to computer-assisted instruction (CAI)? We're always looking for new ideas and fresh approaches to educational problems.
- Have you created any unusual computer games or simulations? Let our readers experience your excitement and pleasure.
- Perhaps you've modified your microcomputer or have interfaced it with some unique or useful hardware. Send us your how-to-do-it story.

These are just some ideas. Perhaps you have others. Don't worry if you're not a professional writer. Our editorial staff stands ready to help polish up your manuscripts. And we'll be more than happy to send you a copy of our author guidelines.

Please send your double-spaced typed manuscripts, plus disks or cassettes (recorded on both sides) if the article includes program material, to:

99'er Home Computer Magazine/Editorial Dept.
1500 Valley River Drive, Suite 250
Eugene, OR 97401

Cashflow
Explanation of the Program

Line Nos.	
100-140	Program header.
150-190	Program setup. Lines 160-180 contain all the variable and subprogram names used in the program. This increases the speed of Extended BASIC's pre-scan function, which is turned off in line 190. See the Extended BASIC manual or supplement for details.
210-270	Prints title screen.
280	Opens CASHDATA file in UPDATE mode (the default value).
290-330	Prints menu.
340-650	Alters accounts.
660-670	Subroutine calls to enter new items.
680-720	Deletes items.
730-740	Subroutine calls to complete changes.
750-960	Displays accounts.
970-1200	Accepts input data for accounts.
1210-1300	Totals accounts.
1310-1460	Prints data to CASHDATA file.
1470-1550	Inputs records from CASHDATA for alterations.
1560-1570	Displays "Working . . . " message.
1580-1610	Displays payments/savings messages.

Cashflow . . . from p. 21

```
100 !**************
110 !* CASH FLOW *
120 !**************
130 REM BY JOEL S. MOSKOWITZ
140 !  99'ER VERSION 2.10.1XB
150 DIM AK(16,12),EX(12),I$(16),IT
    (16,12),MO(16,4),MO$(16,4),NP(
    12),X(16,12),X$(16,4),M$(16),P
    (12),SA(13),T(12),U(16)
160 CALL CLEAR :: GOTO 190 :: A ::
     A$ :: B :: C :: DEL :: I :: K
     :: M :: PM :: PT :: R :: S ::
     SAV
170 CALL SCREEN :: CALL SOUND :: C
    ALL COLOR :: CALL CHAR :: CALL
     HCHAR :: CALL VCHAR :: CALL K
    EY
180 DATA JANUARY,FEBRUARY,MARCH,AP
    RIL,MAY,JUNE,JULY,AUGUST,SEPTE
    MBER,OCTOBER,NOVEMBER,DECEMBER
190 DEF RD(X)=INT(X+.5):: !@P-
200 IMAGE #####
210 ! TITLE SCREEN
220 CALL SCREEN(11):: CALL COLOR(1
    4,2,13)
230 CALL CHAR(95,"0000FF"):: CALL
    CHAR(134,"80703E1F07000000010E
    7CFBE0000000FF80B9BABA89B0FFFF
    0111A9A91101FF")
240 DISPLAY AT(9,11):"CASH FLOW":T
    AB(5);"____________________":
     : : : :
250 FOR A=1 TO 24 STEP 23 :: FOR B
    =3 TO 30 STEP 5 :: CALL HCHAR(
    A,B,134):: CALL HCHAR(A,B+1,13
    6):: CALL HCHAR(A,B+2,137)
260 CALL HCHAR(A,B+3,135):: NEXT B
     :: NEXT A :: CALL VCHAR(2,3,3
    6,21):: CALL VCHAR(2,31,36,21)
270 FOR M=1 TO 12 :: READ M$(M)::
    NEXT M
280 OPEN #1:"DSK1.CASHDATA",INTERN
    AL,RELATIVE,FIXED 255
290 ! MENU
300 CALL CLEAR :: CALL SCREEN(8)
310 DISPLAY AT(7,2):"CHOOSE:": :"
      1. SET UP NEW ACCOUNTS": :"
      2. CHANGE ACCOUNTS": :"    3.
     DISPLAY ACCOUNTS": :"    4. EN
    D PROGRAM"
320 CALL KEY(0,K,S):: IF S=0 OR KK
    49 OR K>52 THEN 320
330 CALL CLEAR :: ON K-48 GOTO 350
    ,370,760,1610
340 ! SET UP NEW ACCOUNTS
350 A=0 :: GOSUB 980 :: GOSUB 1160
     :: GOSUB 1570 :: GOSUB 1220 :
    : GOTO 300
360 ! CHANGE ACCOUNTS
370 CALL CLEAR :: GOSUB 1480 :: GO
    SUB 1580 :: GOSUB 1600 :: DISP
    LAY AT(22,9):"READING DATA..."
     :: GOSUB 1500
380 DISPLAY AT(21,1)BEEP:"PRESS: 1
    . TO ALTER ITEMS":TAB(8);"2. T
    O ENTER NEW ITEMS":TAB(8);"3.
    TO DELETE ITEMS":TAB(8);"4. CH
    ANGES COMPLETED"
390 CALL KEY(0,K,S):: IF S=0 OR K<
    49 OR K>52 THEN 390 ELSE ON K-
    48 GOTO 410,670,690,740
400 !     ALTER ITEMS
410 DISPLAY AT(21,1):"ENTER THE NU
    MBER OF THE ITEM":"YOU WANT TO
     CHANGE. IF YOUR":"CHANGES ARE
     COMPLETE,":"PRESS '0':  1"
420 ACCEPT AT(24,12)SIZE(-2)VALIDA
    TE(DIGIT)BEEP:I :: IF I=0 THEN
     GOSUB 660 :: GOTO 380 ELSE IF
     I<1 OR I>A+1 THEN 420
430 IF I<>A+1 THEN 470 ELSE DISPLA
    Y AT(5,1)ERASE ALL:"PRESENT MO
    NTH: ";PM: :"AMOUNT SAVED:   ";
    "$";STR$(SAV)
440 DISPLAY AT(22,1)BEEP:"PRESS: 1
    . TO ALTER":TAB(8);"2. TO CONT
    INUE"
450 CALL KEY(0,K,S):: IF S=0 OR KK
    49 OR K>50 THEN 450 ELSE IF K=
    49 THEN GOSUB 1160
```

Continued on p. 51

Excerpts from the

of news & happenings in the Home Computer world

TI LASSOS DISK-BASED SOFTWARE ON "HIGHER FUNCTIONALITY" COMPUTERS

With the signing of Broderbund and Spinnaker to TI's much-publicized software licensing program—whereby TI translates the coding then manufactures/markets the ROM cartridges itself—the Texas giant has initiated a new acquisitions policy aimed at bringing over the best software, previously available only in disk implementation on "higher functionality" computers such as the Apple II. This move will secure for TI certain popular titles that can't be implemented on less-sophisticated cartridge computers.

BUSINESS SOFTWARE DEVELOPERS TO SLASH PRICES FOR HC MARKET

Developers of business/professional software for the $2500 PC market are expected to slash prices on their $300-$700 productivity packages as they finally enter the upper-end of the under-$1000 home computer market. To get retail prices down low enough, the purveyors of the word processing, spreadsheet, and database wares will most likely decrease the quality of the packaging and limit their low-cost line to "defeatured" versions requiring no support. In the HC market, analysts are predicting that personal database applications will far outsell spreadsheets.

LOW-PRICED PRODUCTIVITY COMBOS CREATE PRINTER DURABILITY PROBLEMS

Although business applications such as word processing are migrating down from high-cost professional systems to mass-market implementations, new letter-quality printers in this price range cannot be built as solidly as their more expensive cousins. Service engineers are concerned that consumers who operate small businesses and are eager to put their new systems "to serious work" may inadvertently over-tax printer duty cycles and cause premature failures by pushing equipment to do more than manufacturers have intended.

TI SECURES 1-YEAR MARKET LEAD WITH MBX EXPANDER

Although other big names in personal computing have been courting Milton Bradley to latch on to their speech recognition technology as implemented in the MBX Expander peripheral, MB's agreement with TI precludes another microcomputer implementation of MBX until the TI-compatible unit is on the market for 1 year. MB can and will release the Atari VCS video game version in time for holiday sales. The package marketed by Texas Instruments includes the keypad controller, a headset microphone, and one joystick unit at a suggested retail price of $129.95. An additional joystick is available for $39.95. The second joystick port on the keypad unit, coupled with the rotation capability (Theta control) in the firmware, suggests the possibility of "mouse-like" applications for the device in 1984.

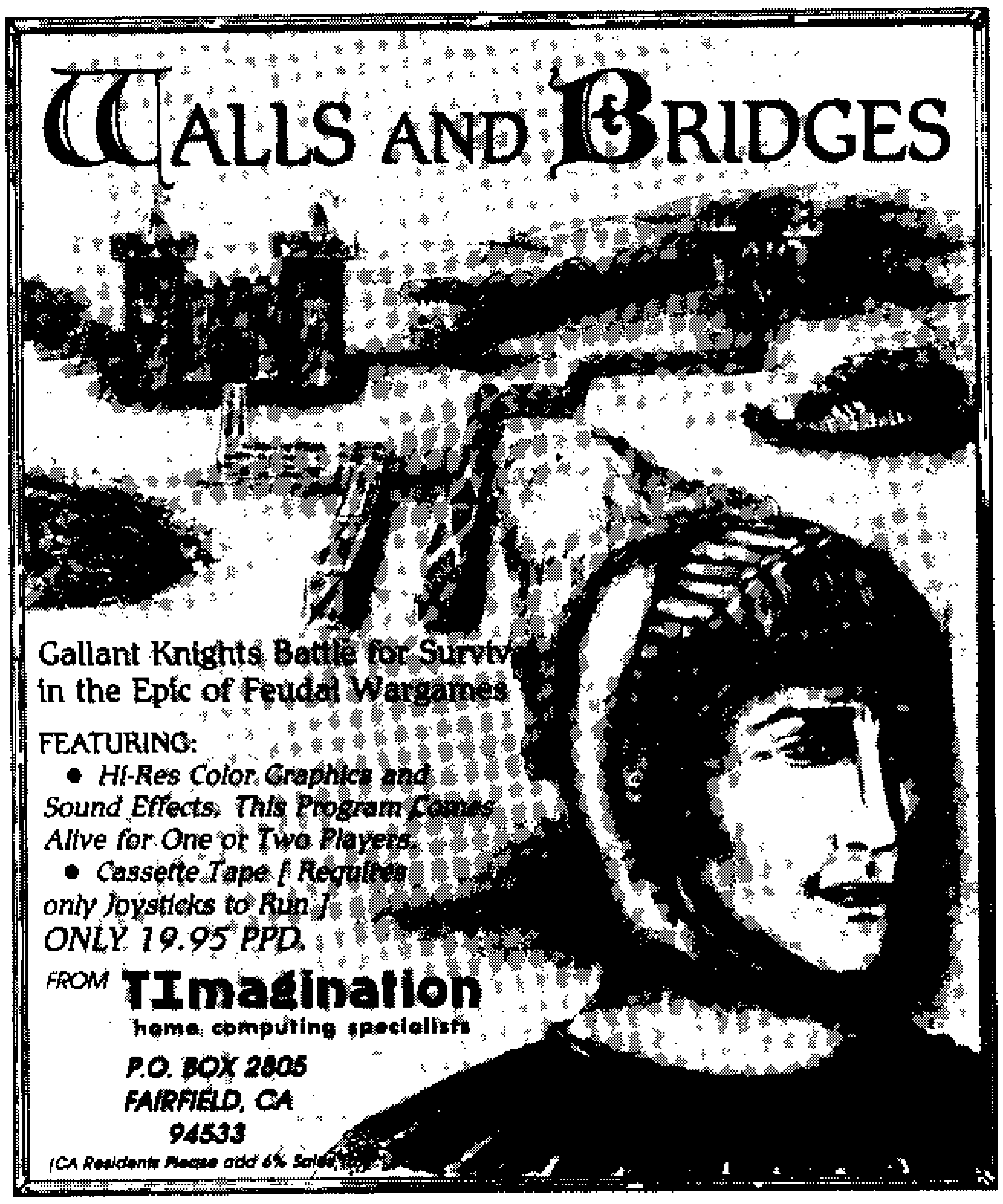
P-BOX PROMO AND CP/M AVAILABILITY TO DRIVE DISK USAGE

Significant new numbers of Home Computer users are expected to add floppy disk capability as TI's promotion continues in full force. TI gives away a free Peripheral Expansion Box with the purchase of 3 cards or designated software packages. Additional impetus for HC users to obtain disk capability is expected to come from the recent announcement by Morning Star Software (of Beaverton, OR) of a CP/M processor board for TI's free P-BOX, plus a CBASIC interpreter.

99'er Digest is a marketing information service for retailers, distributors, third-party vendors, sales representatives, industry analysts, and other TI-watchers interested in the home computing, personal computing, and portable computing markets in which Texas Instruments is present. The publication is issued biweekly and mailed First Class. Appropriate items of consumer interest are excerpted from the Digest in the monthly 99'er Home Computer Magazine. For subscription details contact: Emerald Valley Publishing Co., 1500 Valley River Drive, Suite 250, Eugene, OR 97401.

CP/M and CBASIC are registered trademarks of Digital Research, Inc.

99'er Digest is a trademark of Emerald Valley Publishing Co.



WALLS AND BRIDGES

Gallant Knights Battle for Surviv
in the Epic of Feudal Wargames

FEATURING:
- Hi-Res Color Graphics and Sound Effects. This Program Comes Alive for One or Two Players.
- Cassette Tape [Requires only Joysticks to Run]

ONLY 19.95 PPD.

FROM **TImagination**
home computing specialists
P.O. BOX 2805
FAIRFIELD, CA
94533
(CA Residents Please add 6% Sales

Shugart 5¼' Disk Drive
SA-405
NEW
184.95
Guaranteed for 270 days
6ms T-T, SS, SD or DD

5¼" Disk Drive Power Supplies
- Cases accommodate all standard 5¼" drives
- New chip resistent finish
- Over current and over voltage protection
- Dealer inquiries invited
- Call or write for quantity discounts
- Guaranteed in writing for 120 days

Dual Power Supplies

•Horizontal – 12x12x3½	$74.95
•Vertical – 7x12x6	$74.95
•Open Frame – 7x2x3 w/o case	$59.95
•Single Horiz. P/S – 6x12x3½	$44.95
•Custom 4' 2-Drive Cable	$21.00
•4-Drive Cable	$32.00
•Dual Case, Horiz. or Vert. (w/o P/S)	$29.95
•Single Case, Horiz. (w/o P/S)	$21.95

Terms: Personal checks allow 14 days, COD, MO., Certified Checks . . . Credit Cards add 3.5% Shipping and Handling: $3.00 West and $5.50 East states. All shipping UPS surface, other means extra. Canadian orders extra.

Send to:
C.P.R.
P.O. Box 834,
Oak Harbor, WA 98277

or call . . .
(206) 679-4797

Assemblers . . . from p. 17

use it for output from ASM2. If you have a printer, you can both LIST your source statements from BASIC with ASM1 loaded and produce an assembly listing with AMS3.

All this reading and saving on cassette causes the MAX Assembler to run slowly. For example, it took about 30 minutes to run ASM1 against the sprites sample program mentioned before, after the source code had been typed in and edited so that no syntax errors remained. It then took ASM2 another 50 minutes or so to load the Mini Memory with machine code.

The Dow Editor/Assembler

John T. Dow
6360 Caton
Pittsburgh, PA 15217
Cassette, $25.00

The Dow Editor/Assembler is also a BASIC program which uses the console's RAM. As the name implies, it contains its own editor for Assembly Language source statements. To use the program, you use BASIC's OLD command to read it from tape and immediately RUN the program. The Dow Editor/Assembler comes to life and is ready to accept any of several commands:

NEW: start a new program.
SAVE: store the source program on tape.
OLD: read in a previously-saved source program from tape.
LIST: list the source program with relative addresses on the thermal printer.
TITLE: view or change the program's title.
LOAD: load the machine code to the Mini Memory at the specified address.
LINK: call the machine-code program via BASIC's CALL LINK command, for testing purposes.
MINI: view or change contents of memory.
EDIT: use the Dow Editor on your source program.

To start entering a source program, you might enter NEW and then EDIT. The editor itself has several commands that let you move around in and change the source program. Typing E puts you into enter mode for putting new statements into your source program. If you insert source statements, the program automatically moves any following statements down by adjusting their addresses. As you enter each source statement, the Dow Editor/Assembler will object to any syntax errors right away. Correct statements cause a "program counter" to be incremented for the next statement, so you can see how many bytes of machine code have been generated so far. You can also delete source statements. You generally stay in edit mode until the source program looks just right, and then exit and SAVE your source program to tape. Then you use the LOAD command to make the assembler put the machine code into Mini Memory at the specified address. The LOAD portion of the processing for the sprites sample program took about five minutes.

The format of the Dow Editor/Assembler's source statements is fixed. (See Figure 1C for a sample.) The first three columns contain a label (of up to three characters), and there is a colon in column 4; you can have up to 40 labels. If a statement has no label, then the first four characters must be blank. Next comes the op code; all 9900 Assembly Language op codes except RT and NOP are supported. The operands start in column 10 and are separated by semicolons instead of commas (again, hard on old programmers but necessary because the assembler is written in BASIC). After these come the operands, which are similar in form to 9900 Assembly Language operands except that the symbol $ (meaning the current location) cannot be used, and register operands must be preceded by R. The Dow Editor/Assember supports the assembler directives DATA, BYTE, TEXT, BTXT (to bias text characters by >60 for you, if your program will be called from BASIC later), BSS and EQU. After these fields, you may put some comments. When you press ENTER to tell the computer that the statement is finshed, there is a pause while the program processes the statement. An incorrect statement is rejected right after it is entered.

Continued on p. 61

computer gaming
T.M.
LAREDO

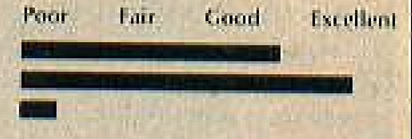
CAVERN QUEST

A Review

By Greg Roberts

99'er HCM Staff

Program Type:	**Multi-screen arcade game.**
Author:	**Joe Macchiarulo**
Language:	**Extended BASIC**
Distributor:	**Moonbeam Software** **2 Bridge St.** **Northampton, Ma. 01060**
Price:	**$19.95 cassette or diskette**



Taking my first look at *Cavern Quest*, I didn't see a cavern at all; the screen's pattern of green stones suggested a pond full of lily pads—as if to say that here was yet another (heaven forbid) frog game. Paying closer attention, I was intrigued to find tunnels inhabited by menacing troglodytes. As I spelunked my way through the dark and the dank, I ran into bats, ghosts, scorpions, and snakes. How to avoid these dangers? Jump over them, naturally—a trick familiar to anyone who has played *Donkey Kong*. Yes, repetition in games design is inevitable—limited as we are by the technology. But there is nothing wrong with variations on a good idea (think of grapes and dogs), and the smattering of *Kong* in *Cavern Quest* only adds to the richness of its pedigree.

Cavern Quest offers much more than a jump-rope challenge: It features three radically different screens—three separate games, really. After you make it through the four caverns of the first screen, your second quest takes you to the edge of a bottomless pit; you cross it by getting a grip on some vines swinging by—and grabbing them before the deadly spider climbs up to you. Clinging to the vines,you must drop safely to the other side, reaching the door of the magic chamber.

In the third act you fight off a bevy of beasts to win their treasures. (The game holds to an intriguing old folk tradition of dumb beasts guarding things they have no business caring about. . .like the contents of King Kong's fist). A treasure appears at the bottom left side of the screen, its point value displayed at the top of the screen. Also at the top are three creatures who compete with you for the treasure. If you can destroy all three with your arrow (located at the right of the screen and released via the joystick fire button), you get the treasure. Once you've achieved success, the game takes you back to the first screen,

Continued on p. 37

computer gaming™

Computer Gaming is a section for all game lovers—players, designers, and programmers of microcomputer games. Regular features include product reviews, letters to the editor, player strategy, a question and answer forum, a Hall of Fame for high scorers, tutorial articles on game design and programming, plus interviews with professionals in the world of computer gaming.

All submissions for *Pros on Programming* are governed by the same conditions and payment rate as manuscripts sent to other departments of *99'er Home Computer Magazine*. Materials submitted for the features shown below are treated the same for Copyright purposes as *Letters to the Editor* in *99'er Home Computer Magazine* (as explained in the Masthead); if chosen for publication, the material (except for *99'er Hall of Fame*) will earn for its author a free computer game (either TI or third-party) and/or a one-year subscription to this magazine.

99'er Hall of Fame candidates with high scores in TI, third-party, or *Computer Gaming* games must completely describe the conditions under which their scores were achieved (i.e., skill level, keyboard or joystick use, screen number, partner participation, appearance of screen, etc.) Candidates may not be directly related to or affiliated with the programmer of the game or the publishing firm. No compensation will be provided to new inductees whose names are chosen to be immortalized—Fame is its own reward . . .

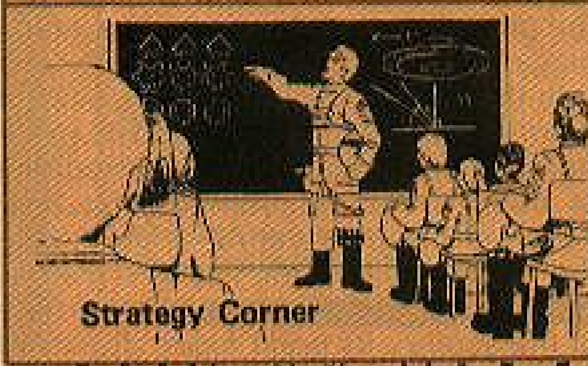
Game Review Criteria

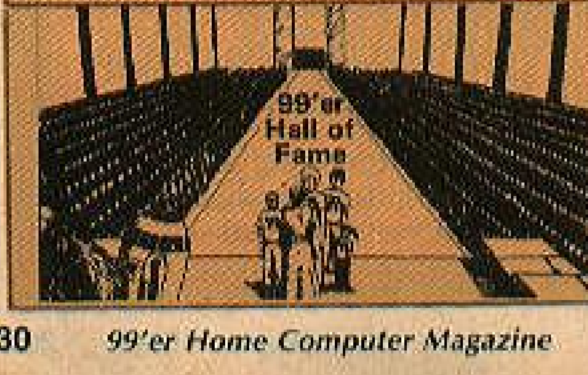
Game Performance measures how well the game responds to the player's commands, rates the quality and realism of the graphics and animation, and examines how well the sound effects, music or speech are integrated into the game. It also determines whether the game delivers what is promised in its advertisements.

Engrossment focuses on that intangible quality that holds the player on the edge of his seat while the hours tick by unnoticed. The game's *staying power* is also assessed.

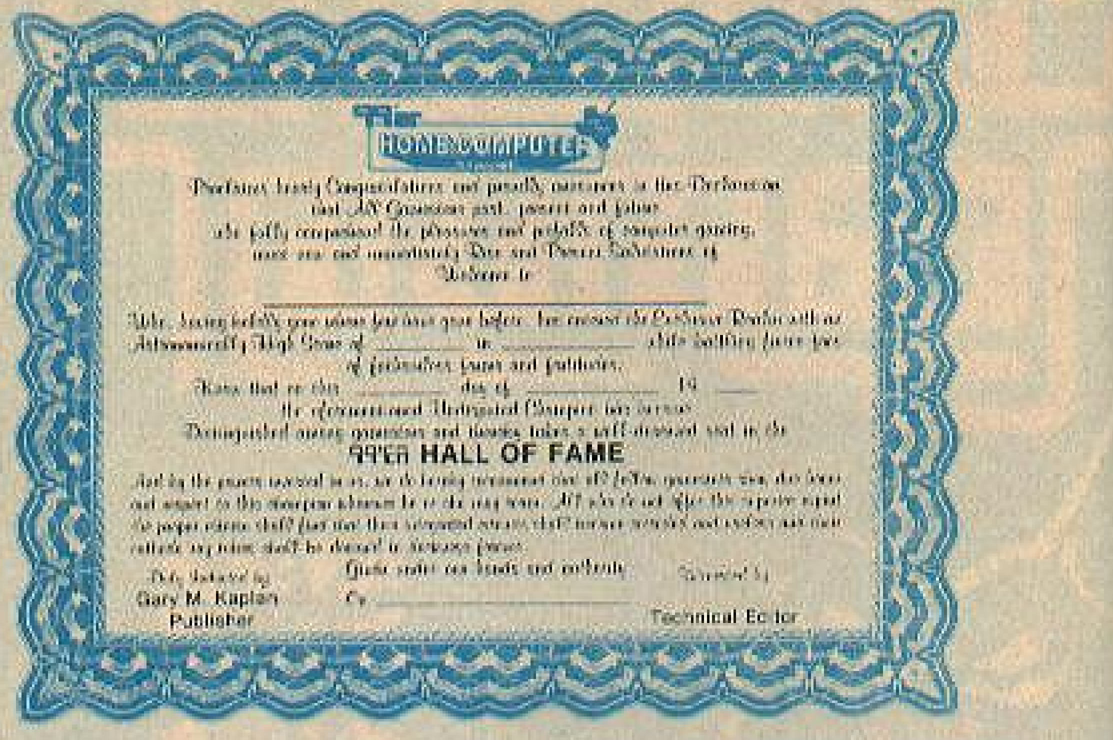
Documentation rates the printed matter that comes with the game. It notes whether the instructions are clear, comprehensive and easy to use, whether the machine configuration requirements are spelled out, and looks for such information as how to load the program, use the keyboard, and restart the game.

Adventure Registry





99'er Hall of Fame



The HOME COMPUTER

99'ER HALL OF FAME

Gary M. Kaplan
Publisher

Technical Editor

Computer gaming devotees! We are delighted to announce that the recognition to which you have so long been entitled is now yours. In this history-making issue of *99'er Home Computer Magazine* we proudly display our *99'er Hall of Fame Certificate of Induction*. From this day forward, all of you record-breakers (past, present and future) will receive your own special certificate bearing your name, game and outstanding score! Hall of Famers of the past will also be rewarded if they send in their current address as soon as possible. We'll verify your eligibility and send you your certificate post haste! Aspiring Hall of Famers—send in those screen pictures and polish up your 8x10 frame to prepare to receive the coveted certificate which preserves your high score for posterity. So, good luck, all of you game players passionately engrossed in the pursuit of high scores. We'd love to reserve a spot for you in the prestigious *99'er Hall of Fame*.

We are proud to induct the following gamesters into the 99'er Hall of Fame:

Name: **Jonathan Kalman, age 11 (Ontario, Canada)**
Game: **Attack**
Score: **256,000 (level 4)**

Name: **Janie Reddington (Palatine, IL)**
Game: **Car Wars**
Score: **32,740**

Name: **Pam Jenness, age 19 (Orangevale, CA)**
Game: **TI Invaders**
Score: **32,003**

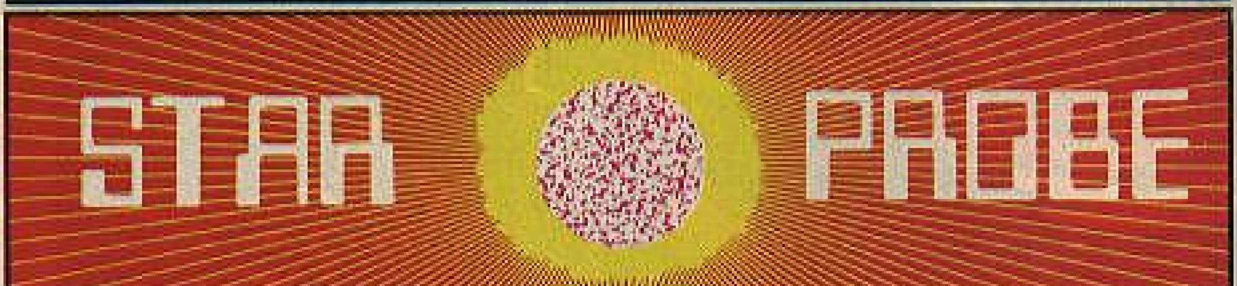
Name: **Randy Shamblin (Pomeroy, OK)**
Game: **Tombstone City**
Score: **6,597,850**

Name: **Matthew O'Connor (Victoria, Australia)**
Game: **Parsec**
Score: **2,994,100**

Name: **Sam Earl, age 4 (Carmel, IN)**
Game: **Parsec**
Score: **48,000**

Name: **Dwayne Williams, age 14 (Ontario, Canada)**
Game: **Munchman**
Score: **249,620**

Name: **Robert Waech, Sr. (Milwaukee, WI)**
Game: **Henhouse**
Score: **128,560**

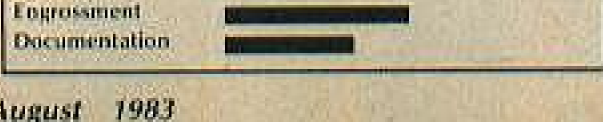


A Review by Erin O'Connor & Deborah Amity

99'er HCM Staff

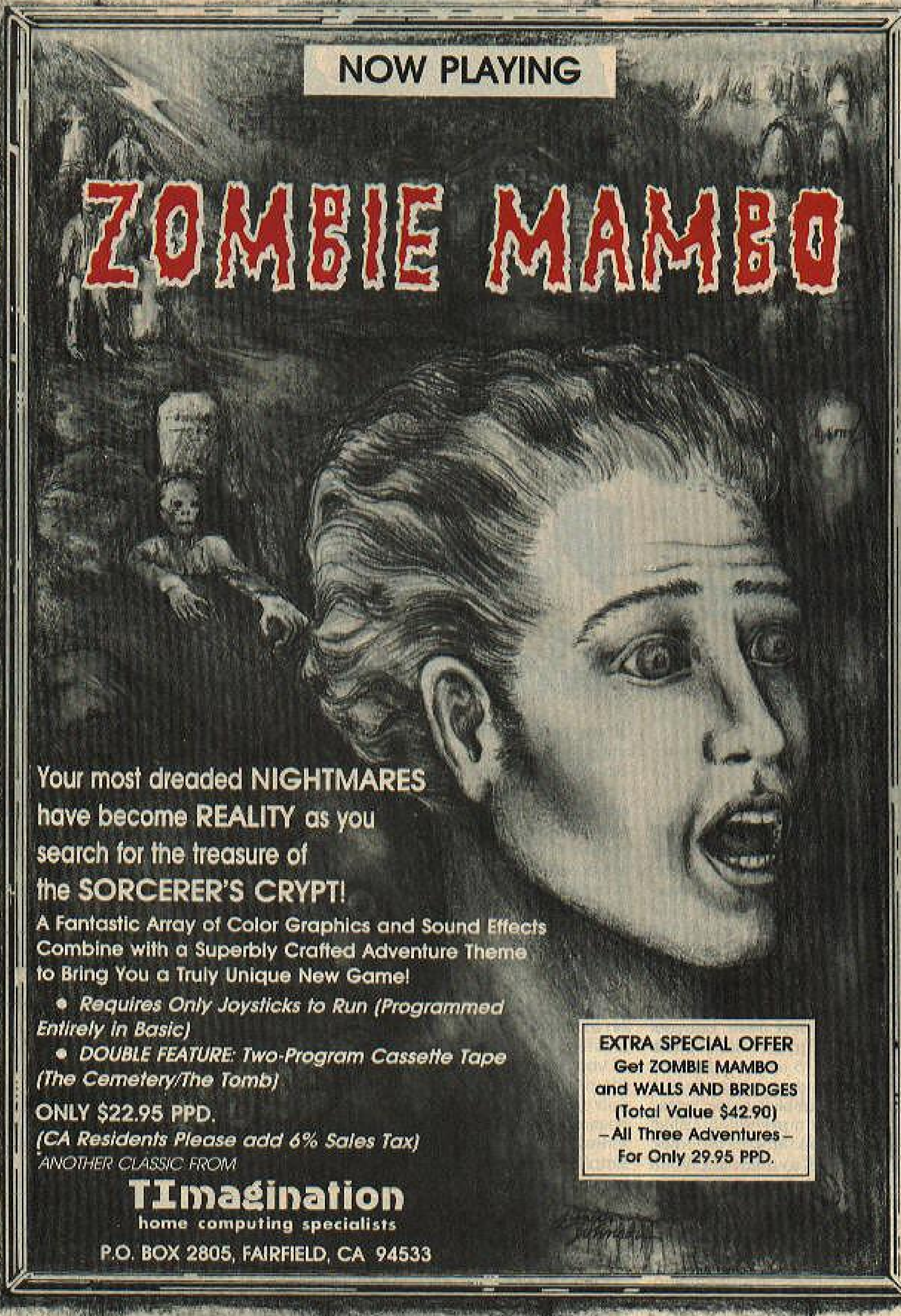
Name:	**Starprobe 99**
Author:	**Mark C. Sumner**
Program Type:	**Scrolling maze**
Language:	**BASIC**
Distributor:	**Challenger Software International** **P.O. Box 50150** **St. Louis, Missouri 63105**
Price:	**$17.95**

System Requirements:
Cassette Recorder and Cable



Way out in the galaxy, hovering over a small moon in the Gamma-Hydra system, your starprobe is poised, ready to descend into who knows what nefarious Xyolian activity in their underground military base. You are calm because you don't face any personal danger. Your remote control via the NIC (Near-Infinite Communications) Beam will guide the starprobe down into a cave on this moon. Your mission is to knock out the threat of Xyolian attack. When the probe reaches the Xyolian cave it must thread

Continued on p. 80



NOW PLAYING

ZOMBIE MAMBO

Your most dreaded **NIGHTMARES** have become **REALITY** as you search for the treasure of the **SORCERER'S CRYPT!**

A Fantastic Array of Color Graphics and Sound Effects Combine with a Superbly Crafted Adventure Theme to Bring You a Truly Unique New Game!

- *Requires Only Joysticks to Run (Programmed Entirely in Basic)*
- *DOUBLE FEATURE: Two-Program Cassette Tape (The Cemetery/The Tomb)*

ONLY $22.95 PPD.

(CA Residents Please add 6% Sales Tax)

ANOTHER CLASSIC FROM

TImagination

home computing specialists

P.O. BOX 2805, FAIRFIELD, CA 94533

EXTRA SPECIAL OFFER
Get ZOMBIE MAMBO
and WALLS AND BRIDGES
(Total Value $42.90)
– All Three Adventures –
For Only 29.95 PPD.

GAMEWARE

BUFFET

ESTABLISHED FOR THE 99/4A

Jungle Jim

By Michael McCue

27 Curie Road
Cornwall-On-Hudson, NY 12520

The dense, dark Brazilian jungle turns and twists menacingly, but you are not afraid. You know that the acid pits, rolling logs, hungry cannibals, slithering snakes and sudden bonfires are only temporary hazards thrust upon you to test your persistence and prevent you from gathering the giant diamonds which lie in the bush.

Not only can you rise above these obstacles by jumping over them, but you have allies in the trees. Benevolent monkeys will appear to rescue you from perilous pits, spiriting you up gently and musically above the bubbling acidic ooze. If you can catch one, a prehensile-tailed deliverer will carry you through the trees beyond harm. Thanks to them and your own athletic prowess, you can gather piles of the sparkling diamonds and rack up quite a fortune to show for your time spent in this jungle adventure.

This game has bright appealing graphics to keep your spirits high. All the action takes place in front of a three-dimensional backdrop of jungle complete with trees, flowers, grass and mountains. Even the obstacles you encounter are visually entertaining as they try to thwart your diamond gathering mission.

It's a Jungle Out There

The dangers you encounter on your way to wealth and high scores will put your reflexes to a real test. Particularly treacherous are the cannibals and rolling logs. To avoid these hazards, you must jump over them by pressing [I] on your keyboard. The arrow keys [S] and [D] move Jungle Jim backwards and forwards. To grab a diamond you need only to run past it.

The acid pits provide a real challenge. You cannot jump over them; instead you must jump up and grab onto a passing monkey—a bit like catching the brass ring on a merry-go-round. To do this, press [I] and release it *as soon as you are in the air.* If you have the right touch and have jumped under the monkey, it will carry you safely across the pits—or any other hazard. You can boogie through the trees forever, but when you *do* want down, simply press any key to be released. Once you have run the full length of the screen, you will automatically be transported to the next one.

Behind the Screens

In creating *Jungle Jim* my goal was to come up with a new COINC routine and a new key scan set-up in a game that wasn't a space shoot'em-up exercise. After many hours of programming, I came up with a game I think you'll find fast, fun and challenging, with exacting coincidence checks. All that remains for you to do now is power up your TI and key in *Jungle Jim.*

A Challenge

Now that you're privy to all the goings on in the jungle, prepare to collect precious gems while you jump and jog your Jungle Jim to new heights. Before you pack up your belongings and bid civilization *adieu*, here's a challenge to you from our editors: Anyone who can beat our *Jungle Jim* record of 1500 points (and send us a screen photograph verifying the score) will receive special mention in an upcoming issue and will be inducted into the "99'er Hall of Fame." So, go for it, treasure hunters! We'll see you in the jungle and maybe even in the record books!

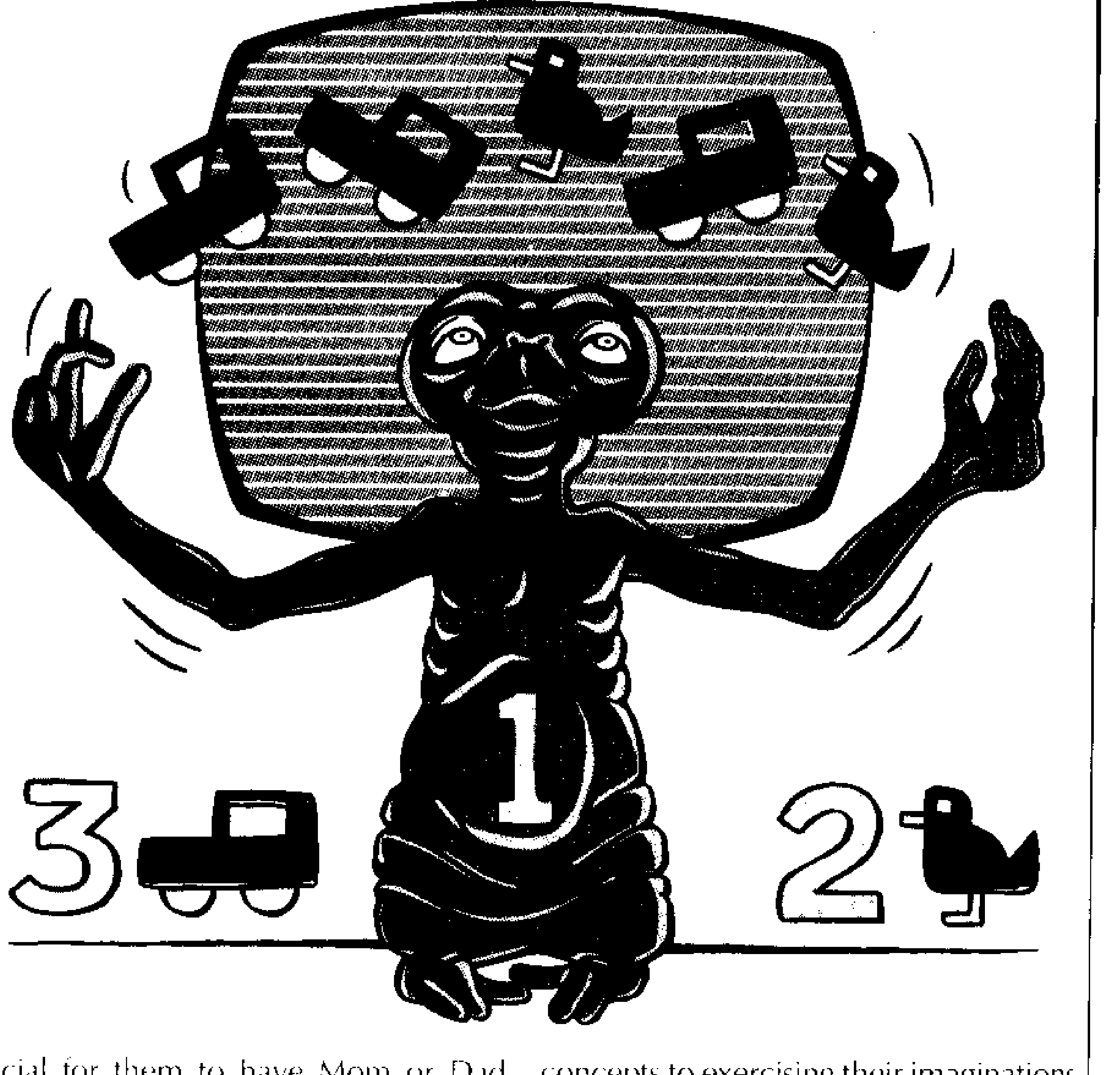
EXTENDED BASIC

Jungle Jim
Explanation Of The Program

Line Nos.	
100-210	Program header.
220-260	Sets flag for first play; branches to subroutines for first play or replay.
270-310	Displays game scene.
320-470	Controls movement of Jungle Jim and obstacles; determines if Jungle Jim has run into an obstacle.

Continued on p. 38

Counting Fun



By Rolynda Brantley
4282 Taos Drive
San Deigo, CA 92117

You and your best friend are in an enchanted toy chest counting your favorite playthings over and over. The toys in this toy chest never break and never get lost. In fact, the more you play with these toys the more toys you seem to have.

Does this sound like a preschooler's dream? Well, in a way it is. *Counting Fun* began as a way to motivate my three-year-old daughter to learn to count. Since I wanted her to be drawn into the program, I began by designing pictorial representations of her favorite things: ducks, hearts, school buses and her special pal, E.T. My artistic talents leave a lot to be desired. But even though E.T. looks more like a gas pump than an appealing alien, Karen loves him. Together they conquer counting and number concepts while playing in the never-empty toy chest that is our TI-99/4A.

Let's Play

The screen displays two lines of toys, with 0 to 5 toys in each line. Each toy announces its appearance with its own unique sound. The bus, for example, honks its horn. Those who have a Speech Synthesizer might want to have E.T. say his famous line when he comes on the screen.

The computer asks HOW MANY ? and displays three miniature pictures of the toy the child is supposed to count in the two lines above. The child, therefore, does not have to be able to read to enjoy doing this program activity by himself. Correct answers receive an audio and visual reward. An incorrect answer is indicated by a different tone and followed by a display of the correct answer.

After the questions have been asked and answered, an encouraging message designed to personalize the game and boost the learner's self-esteem appears. The message I LOVE YOU not only accomplishes both of the above goals, but it is also a friendly, easily recognizable message for any child to read. You may want to change the messages from time to time after your preschooler has learned to recognize them.

The game is very friendly, and young children will have few problems playing it by themselves. All they need to do is press a number key and [ENTER] to go on to the next problem. Although children will feel independent when they can play this computer game by themselves, it is still special for them to have Mom or Dad close by to appreciate the wonders of their learning accomplishments.

Play's the Thing

Our children's fascination with this new technological toy can help them learn all manner of things from letter and number concepts to exercising their imaginations. You can personalize *Counting Fun* with your child's favorite toys and appropriate reward messages, and then just watch the magic happen. If you get a chance, do "phone home" and let us in on the *Counting Fun* in your household.

BASIC *Counting Fun*
Explanation of the Program

Line Nos.	
100-160	Program header.
170-200	Clear screen, input name, and set starting values for variables. (F # of right answers) (W # of wrong answers)
210-270	Initialize colors for character sets.
280-600	Initialize character patterns.
610-670	Set starting values and clear screen.
680-900	Pick random characters and random number of characters and place on screen using subprograms.
910-1470	Ask questions and input responses.
1480-1500	Print total of right and wrong responses.
1510-1520	Input to start game over.
1530-1950	Subprograms to make characters.
1960-2030	Subprograms to make different sounds for right or wrong answers.

```
100 REM *********************
110 REM *   COUNTING FUN    *
120 REM *        BY         *
130 REM * ROLYNDA BRANTLEY *
140 REM *********************
150 REM 99'ER VERSION 2.10.1
160 REM
170 CALL CLEAR
180 INPUT "WHAT IS YOUR NAME? ":K$
190 W=0
200 F=0
210 CALL SCREEN(8)
220 CALL COLOR(10,9,1)
230 CALL COLOR(11,9,1)
240 CALL COLOR(13,7,1)
250 CALL COLOR(14,11,1)
260 CALL COLOR(15,2,1)
270 CALL COLOR(16,16,1)
280 A$="FFFFFFFFFFFFFFFF"
290 CALL CHAR(128,"387CFEFFFF7F7F3
F")
300 CALL CHAR(129,"071F3F7FFFFFFFF
E")
310 CALL CHAR(130,"0000B0B0B0")
320 CALL CHAR(131,"3F1F1F0F0F07070
3")
330 CALL CHAR(132,"FEFCFCF8F8F0F0E
0")
340 CALL CHAR(133,"030101")
350 CALL CHAR(134,"E0C0C08")
360 CALL CHAR(136,"FF0F0F0F0F0F0FF
F")
370 CALL CHAR(137,"FF030303030303F
F")
380 CALL CHAR(139,"3F3F3F3F3F3F3FF
F")
390 CALL CHAR(138,A$)
400 CALL CHAR(144,"FF7E3C")
```

Continued on p. 41

Moonbeam Software: Superior Software for the TI-99/4(A)* Home Computer

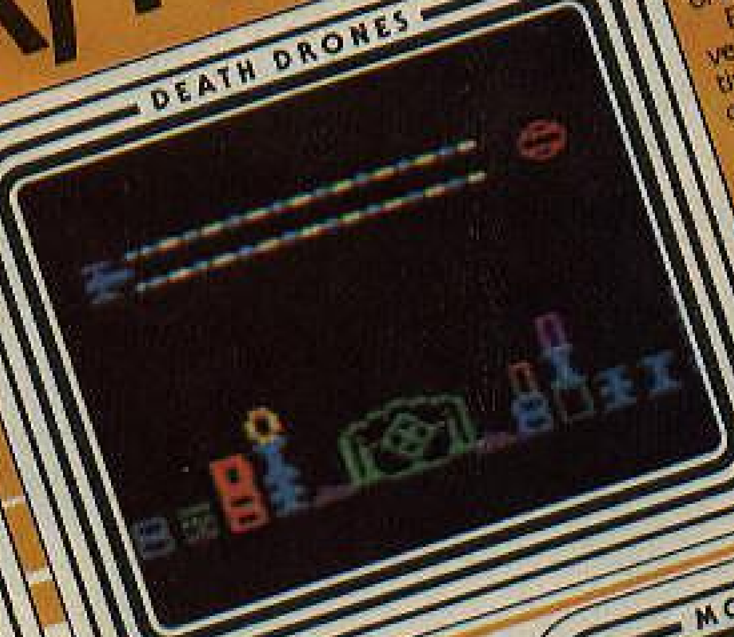
Moonbeam Software will turn your computer into an arcade machine! Super-fast action games now ready to take over your controls! Available in TI-BASIC and/or Extended BASIC for the 16K console!

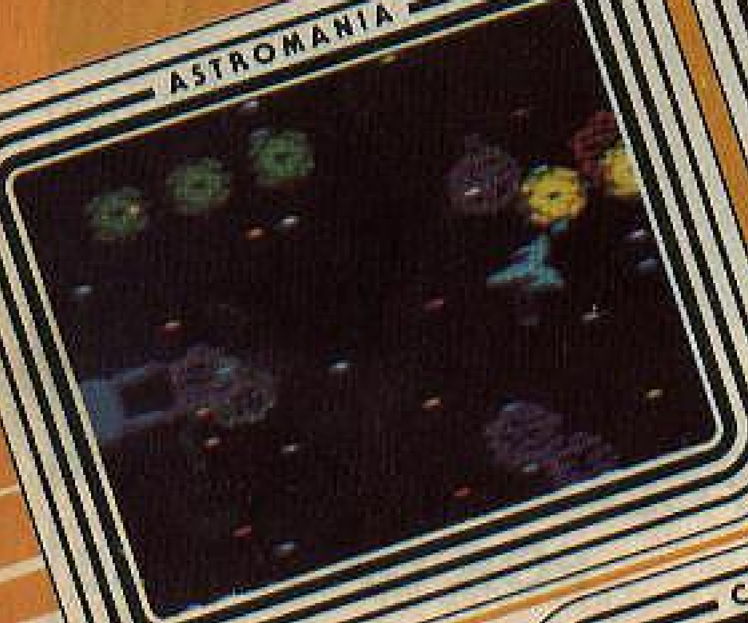
Each game includes both keyboard and joystick versions (available on cassette or diskette). Attractively packaged in sturdy, full-color boxes, designed for bookshelf storage!

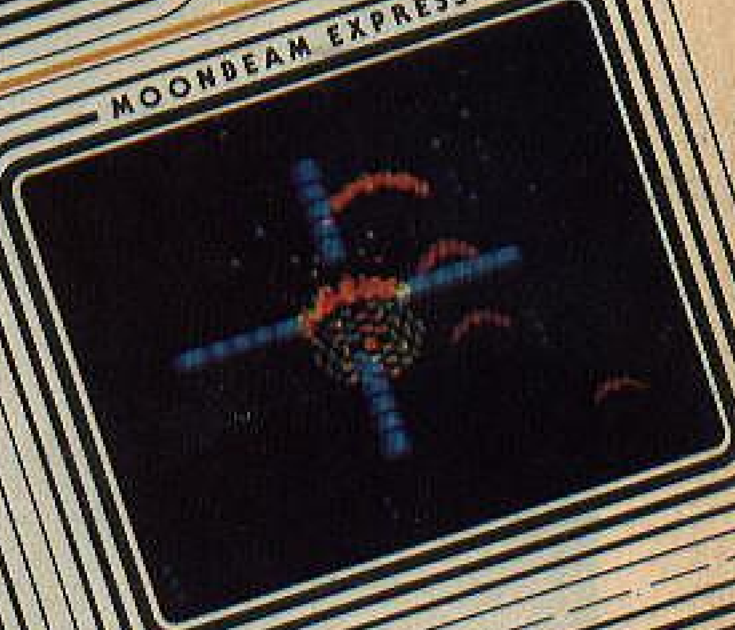
Ask for Moonbeam Software at your local retailer, or for a free color brochure send name and address to Moonbeam Software, 2 Bridge St., Northampton, MA 01060.

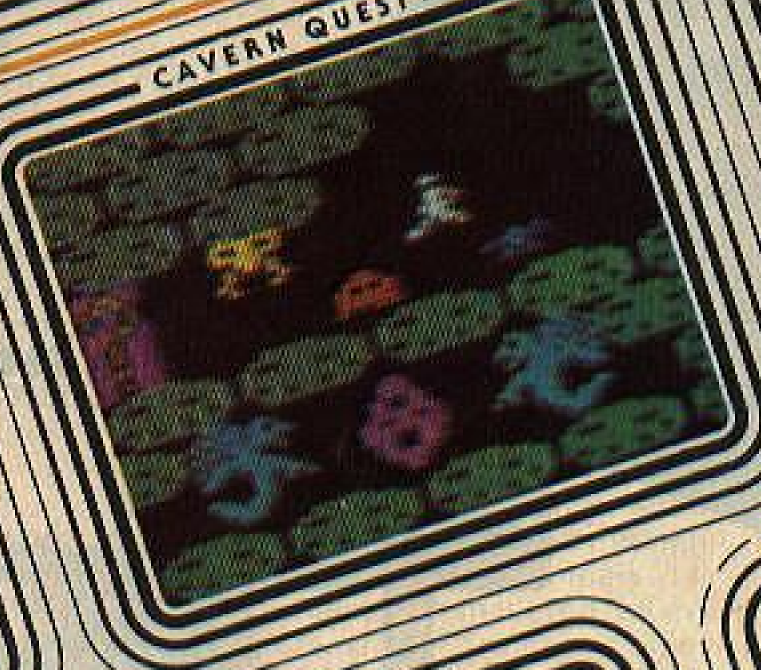
Dealer inquiries invited. Call Mr. Moon, 413-586-6290.

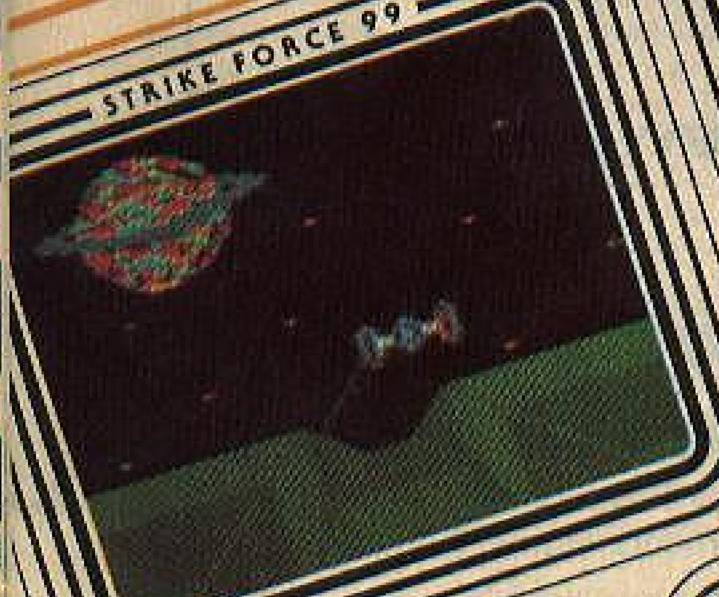
*Trademark Texas Instruments Inc.
© All games copyright Moonbeam Software

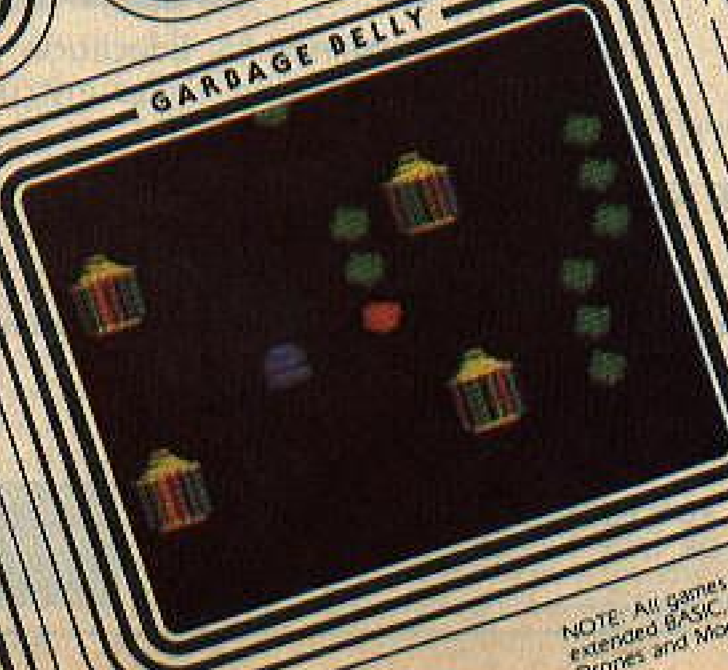

DEATH DRONES

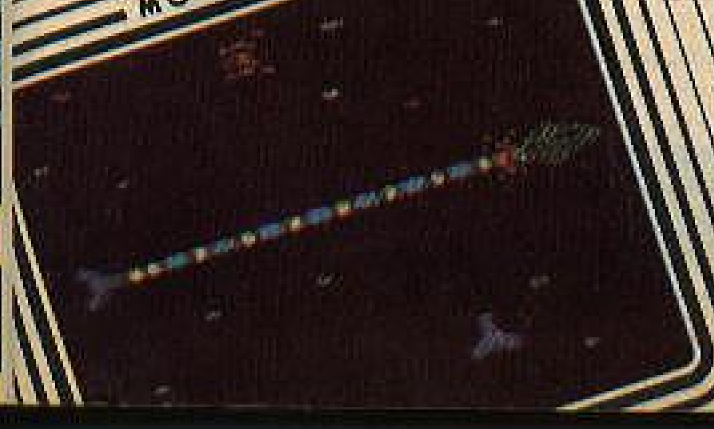

ASTROMANIA


MOONBEAM EXPRESS


CAVERN QUEST


STRIKE FORCE 99


GARBAGE BELLY


MOONVASION

NOTE: All games require extended BASIC, except Death Drones and Moonvasion

MOONBEAM SOFTWARE

☐ DEATH DRONES	C D	$14.95
☐ MOONVASION	C D	14.95
☐ GARBAGE BELLY	C D	19.95
☐ STRIKE FORCE 99	C D	19.95
☐ MOONBEAM EXPRESS	C D	19.95
☐ ASTROMANIA	C D	19.95
☐ CAVERN QUEST	C D	19.95

Circle C for cassette, D for diskette version

Mail to
Moonbeam Software
2 Bridge St.
Northampton MA
01060

Name __________

Street __________

City/State/Zip __________

Signature/Date __________

☐ Enclosed Check/MO. ☐ M/C ☐ VISA

Card No. __________ GAMES $ __________

Exp. Date __________ Mass. Res. Add 5% __________

Shipping & Handling 1.50

TOTAL $ __________

8/83

WHEN PEOPLE BUY A TEXAS INSTRUMENTS HOME COMPUTER FOR UNDER $100 . . .

Also Available in Foreign Language Versions

. . .THEY'LL SELECT WORLD-CLASS SOFTWARE℠ FOR UNDER $10

THEY'LL SELECT

99'er.WARE™

Entertainment, Education, & Productivity Software
for the Texas Instruments Home Computer

IN EACH 99'er-PAK™ TI USERS RECEIVE TRIPLE THE VALUE:

- **A Quality Game, Instructional Program, or Utility on Cassette**
- **A Flip-Card Book that Explains the Software, PLUS Teaches Beginners a Lesson in Computer Programming**
- **A Durable & Attractive Ring-Binder Collector's Case**

ASK FOR IT FROM YOUR FAVORITE DEALER. IF HE DOESN'T HAVE IT YET, ASK WHY!?

EMERALD VALLEY PUBLISHING CO.
1500 Valley River Drive, Eugene, OR 97401 Tel. (503) 485-8796

99'er-pak and 99'er-ware are trademarks, and World-Class Software is a service mark of Emerald Valley Publishing Co.

Pewterware Presents GREAT GAMES

BLUEGRASS SWEEPSTAKES

Place your bets on an eight horse field. Up to eight players take their chances during eight races. The winners of each race will compete together in the ninth race—the BLUEGRASS SWEEPSTAKES! This is a great game for families and parties and has outstanding "graphics." (TI-Basic)

SNOW TREK

You load your snowmobile into your van and head for the country. But watch out! The road is icy! You must avoid stalled cars and stay on the road. You unload your snowmobile and zip into the the field where you see a cute little number running across the snow. You cannot resist and chase it. But be careful. Number crunching can be dangerous! Quick thinking and good reflexes are necessary to score the highest on this game for one player. (TI-Basic)

SNOW TREK (cassette $14.95) BLUEGRASS (cassette) $14.95

These programs are available from your local dealer or by mail from:

Home Computer Systems
P. O. Box 1217
Port Perry, Ontario
Canada LOB 1NO
(416) 985-3126
(Call for prices.)
Dealer inquiries invited.

TENEX
Computer Marketing Systems
P.O. Box 6578, South Bend, Indiana 46660
(219) 277-7726

VISA MasterCard

Cavern Quest . . . from p. 29

and you have to jump over the beasts again. But this time your quest will be harder because of a "claw monster" hanging from the ceiling. This new addition to the cavern seemed an impossible obstacle until I realized that I had to run backwards after jumping over each beast in that first onrushing line. Then, when the long space opened up after the third beast, I ran under the claw monster as fast as my joystick could carry me.

Fazed by Phase Two

Negotiating the remaining cavernwork on the first screen, and quickly gliding through the vine sequence of the second, you try for another, more valuable treasure by killing monsters with your longbow. If you succeed, you return to the cavern to find—you guessed it—a second claw monster. Such is the challenge; with each treasure recovered, the cave sprouts a new horror, until you've taken on twenty claw monsters (plus untold thousands of other beasts) and saved up twenty treasures. At this point the quest would seem impossible to anyone but a thorough video loco.

The game can be frustrating at first. While I was running it for review, several people in this office stopped by and took a turn with the joysticks, each one giving up long before they could see the light at the end of the tunnel. For my part, there must have been a little of the General Westmoreland in me, and I dug in for a while, concentrating on timing the jumps. After a half-hour of practice I could consistently get to the second screen within a few minutes. Riding that magic vine and shooting the monsters with arrows is really not very difficult; it provides a relaxing interlude between the maddening forays through caverns—an engaging feature that shows the overall high quality of this software. The designers of this game are definitely onto the right recipe for difficulty: they know that a simple game soon gets boring and ends up in a drawer, whereas a very difficult game can meet the same fate without ever being played through to the end. To hit the middle mark is a rare achievement, one that even the expensive Command Cartridges sometimes miss. Cavern Quest can get very tricky, but only the impatient and clumsy need despair.

What the game does lack is stunning graphics. You definitely will not confuse these screens with the Technicolor bravura of an uptown arcade game. No, here the monsters are tiny, simply-defined little beasts, and the appearance of the ubiquitous computer ghost with two eyes is almost annoying. Sure, ghosts are easy to make in second grade we cut lots of them out of white paper—but we're expected to move on, aren't we? And the vines, bottomless pit, and magic room are blockier than a Mondrian painting. Nevertheless, the action of the game more than redeems the simplicity of the playing field. After all, would we go to a football game to find beauty in billboards and Astroturf?

Considering the high quality of the game and the slick packaging it comes in (a sturdy four-color carton), the documentation is surprisingly thin: in fact, it's about as well-produced as a grocery-store flyer, and confusing to boot. It fails, for example, to state specifically that the joystick fire button makes your figure jump to the vines and then to the ledge. Neither does it tell you exactly how you acquire the series of treasures—that you have to keep going through screen one in order to try for the next prize. Fortunately, however, you leave all confusion behind as soon as you've stumbled through the screens a time or two.

Cavern Quest is well composed from beginning to end. Like a concerto, the three "movements" of this piece are distinctive, while still holding their continuity via the intricate quest theme in every screen and in the recapitulations to screen one. For its price I know of no other game of equal interest.

SUPPORT OUR ADVERTISERS.

THEY TOO MAKE THIS MAGAZINE POSSIBLE

BEST SOFTWARE

The Best Software at the Best Price.
All Programs By Professional Programmer.

Special Deal:
BUY ANY 2 PROGRAMS, CHOOSE 1 MORE FREE!

FROGGERY:
10 Skill Levels. Jump Your Frog Home Before Time Runs Out, Great Graphics and Sound. $10.

BLADE RUNNER 2020:
Police the Skies. Shoot Only the Red Robot Ships. Watch Out For Evil Star Raiders. $10.

ROBOTRON:
A Robot Chase Game That Will Put You Into A Frenzy and Drive You Beserk. $10.

FREEWAYS:
Can Your Chicken Cross the Freeway at 5 PM? 5 Freeways. $10.

STAR TREK 2:
Advanced Graphics and Sound Improve on This Old Classic. $5.

All programs are in Extended Basic for the TI 99/4A. Joystick required.

New Low Prices plus:
Super Special Deal all 5 only $25.
Specify cassette or diskette.

Send Check or Money Order to:

BEST SOFTWARE
P.O. Box 22446
Baltimore, MD 21203

DOW EDITOR/ASSEMBLER

With the required Mini Memory Module, this BASIC program will change your TI-99/4A from a BASIC computer into an assembly language machine—you will be able to edit and run assembly language programs all day without having to reload the editor/assembler. It will understand all of the TI's instructions and have six directives and several commands. Just as with BASIC, you will be able to save programs on cassette-approximate time: 1 second/statement. You will have full editing ability, including changing, deleting, or inserting statements, and each statement will be checked for errors as soon as you key it in.

Assembling the program into the M.M.M. takes about 3 seconds/statement. Large programs must be broken into modules of no more than about 150 statements, but these may be combined to use the entire 4K of M.M.M. RAM. The manual includes a demonstration program with extensive explanations to help get you started.

You can continue to use the program even if you enhance your system to include printer, expansion memory, and/or disk. In fact, you will be able to convert your programs to TI's Editor/Assembler (which requires most of this extra hardware) without rekeying.

Send U.S. $25.00 to:

John T. Dow
6360 Caton
Pittsburgh, PA 15217

First class postage to U.S. and Canada included—others add U.S. $2.00 for airmail.
PA residents add $1.50 for state sales tax.

32K Memory
$110

Standalone box for the TI 99/4.
Reliable compact design.
Works with all TI peripherals.
Black anodized aluminum case.
90 day limited warranty.

Include $2.00 for shipping. Utah residents add 5% sales tax. Add 3% for MC, Visa.

For orders or more info contact:

Tachyon Systems
5125 S. Westwind Way
Kearns, Utah 84118
(801) 537-7021

MUSIC SOFTWARE
DIRECTORY/UPDATE

PROGRAMS FOR THE
TI-99/4(A) COMPUTER

For the Directory and 2 updates send $12 check or money order to:

LOLITA WALKER GILKES
2701-C West 15th Street, Suite 277
Plano, Texas 75075

(TX residents add 5% sales tax)

Jungle Jim . . . from p. 32

480-710	Selects obstacles randomly and displays them.
720	Branches to music subroutine.
730-740	Increases score if Jungle Jim gets diamond.
750-850	Decreases number of remaining Jungle Jims and checks for replay if no Jungle Jims left.
860-950	Plays musical theme.
960-1110	Defines characters for initial title screen and displays them.
1120-1390	Redefines characters for first play or replay, and locates them on the screen.
1400-1450	Redefines characters for first play.
1460-1500	Displays messages.

```
100 ! **************
110 ! *            *
120 ! * JUNGLE JIM *
130 ! *            *
140 ! *     BY     *
150 ! *            *
160 ! * MIKE MCCUE *
170 ! *            *
180 ! **************
190 !
200 ! 99'ER VERSION 2.10.1XB
210 !
220 RANDOMIZE
230 DEF RRND(N)=INT(RND*N)+1
240 TIME=1 !SETS FLAG TO DISPLAY T
    ITLE SCREEN 1ST TIME THROUGH
250 GOSUB 960 !DISPLAYS TITLE SCRE
    EN
260 IF TIME<>1 THEN GOSUB 1120 !RE
    SETS CHAR DEFINITIONS FOR REPL
    AY
270 DISPLAY AT(1,1)SIZE(LEN(STR$(S
    C))+1):SC :: DISPLAY AT(2,1)SI
    ZE(-2):GUY :: CALL VCHAR(1,3,3
    3):: CALL VCHAR(2,3,33)
280 RESTORE 910 :: C=96
290 CALL COLOR(2,2,11):: CALL COLO
    R(1,13,1):: CALL COLOR(3,2,13)
    :: CALL COLOR(4,11,1):: CALL C
    OLOR(5,2,11):: CALL COLOR(6,7,
    2)
300 CALL COLOR(8,4,11):: CALL COLO
    R(7,15,11):: CALL COLOR(14,14,
    1)
310 FOR D=1 TO 100 :: NEXT D :: CA
    LL SPRITE(#1,92,16,104,60)
320 CALL KEY(0,T,ST):: CALL COINC(
    ALL,HIT):: IF HIT=-1 THEN CALL
     COINC(#1,#10,32,IT):: IF IT=-
    1 THEN GOSUB 730 ELSE GOTO 750
     !CONTROL LOOP
330 IF ST=0 THEN CALL MOTION(#1,0,
    0):: HV=0 :: GOTO 320
340 CALL POSITION(#1,X,Y):: IF Y>2
    04 THEN 460 ELSE IF Y<60 THEN
    CALL SOUND(1,110,1,112,2,114,3
    ):: CALL LOCATE(#1,X,60)
350 IF T=68 THEN HV=10 :: CALL PAT
    TERN(#1,C):: C=C-4 :: CALL MOT
    ION(#1,0,10):: IF C<=92 THEN C
    =112 :: GOTO 320 ELSE 320
360 IF T=83 THEN HV=-10 :: CALL PA
    TTERN(#1,C):: C=C-4 :: CALL MO
    TION(#1,0,-10):: IF C<=92 THEN
     C=112 :: GOTO 320 ELSE 320
370 IF T=73 THEN 390
380 CALL MOTION(#1,0,0):: HV=0 ::
    GOTO 320
390 CALL MOTION(#1,-16,HV*1.16)
400 FOR D=1 TO 20 STEP 4 :: CALL S
    OUND(-310,-3,D):: CALL COINC(#
    1,#7,17,HIT):: IF HIT=-1 THEN
    CALL MOTION(#1,0,10):: HV=0 ::
     GOTO 710
410 NEXT D
420 CALL MOTION(#1,24,HV*1.5)
430 FOR D=1 TO 6 :: CALL COINC(#1,
    #7,17,HIT):: IF HIT=-1 THEN CA
    LL MOTION(#1,0,10):: GOTO 710
440 NEXT D :: CALL MOTION(#1,0,0)
450 CALL POSITION(#1,X,Y):: CALL L
    OCATE(#1,104,Y):: GOTO 320
460 CALL MOTION(#1,0,0):: CALL LOC
    ATE(#1,104,60):: FOR I=2 TO 1
     :: CALL DELSPRITE(#I):: NEXT
    I :: COL=COL+1 :: IF COL=11 TH
    EN COL=14
470 IF COL=16 THEN COL=5
480 CALL COLOR(7,COL,11)
490 EA=RRND(6):: IF EA=1 THEN GOSU
    B 640 :: GOTO 320
500 TR=RRND(4):: IF TR=1 THEN GOSU
    B 660
510 S=RRND(5):: IF S=1 THEN SV=0 :
    : GOSUB 670 :: A=INT(RND*15)+
     :: IF A=1 THEN GOSUB 650 :: G
    OTO 320 ELSE 320
520 FI=RRND(5):: IF FI=1 THEN GOSU
    B 690 :: A=RRND(10):: IF A=1 T
    HEN GOSUB 650 :: GOTO 320 ELSE
     320
530 MS=RRND(5):: IF MS=1 THEN SV=I
    NT(RND*50)-30 :: GOSUB 670 ::
    A=RRND(8):: IF A=1 THEN GOSUB
    650 :: GOTO 320 ELSE 320
540 P=RRND(2):: IF P=1 THEN PV=0 :
    : GOSUB 580 :: GOSUB 650 :: GO
    TO 320
```

PENTACLE SOFTWARE

#1: **TAROT CARD READING** – $15.00 CASSETTE. CONSULT THE CARDS ABOUT ANY FUTURE MATTER OF IMPORTANCE TO YOU – OUR MOST POPULAR PROGRAM!

#2: **QUARTER HORSE FUTURITY** – $12.00 CASSETTE. ALL THE SPEED AND THRILLS OF QUARTER HORSE RACING – GREAT MOTION FOR A BASIC GAME!

#3: **COLOR PERSONALITY TEST** – $10.00 CASSETTE. LEARN ABOUT YOUR PERSONALITY THROUGH YOUR SELECTION OF COLORS – WRITTEN BY A TRAINED PSYCHOLOGIST!

#4: **BIORHYTHM** .... $10.00 GUARANTEED ACCURACY! READ YOUR INTERNAL CLOCKS AND ACHIEVE YOUR GOALS ON YOUR BEST DAYS.

ALL 99/4A—BASIC

SEND CASH, CHECK OR MONEY ORDER TO

PENTACLE SOFTWARE
ROUTE 1, BOX 843
RAGLEY, LOUISIANA 70657
POSTAGE PAID IN U.S.

BIT BYTE BIT SOFTWARE

Presents exciting games for TI 99/4A

Package #137 X-Basic, Joystick $25.
1. FLIP'EM 2. COSMIC BATTLE
3. HORSE RACE 4. BREAK THROUGH

Package #142 X-Basic, Joystick $25.
1. FREEWAY FROGS 2. SPACE DESTROYER
3. LINK FOUR 4. WORD SEARCH

Package #147 Assembler $25.
JAIL BREAK

Fast action arcade type game. Mini-Mem and Exp-Mem and Joysticks required.

15-day money back guarantee (less $5.) $5. coupon with each order. Beautiful sprites and great sound effects!

Specify cassette or diskette.

Bit Byte Bit Software
P.O. Box 565
Coram, N.Y. 11727
Tel: 516-928-6538

```
550 L=RRND(1):: IF L=1 AND TR<>1 T
HEN GOSUB 610
560 M=RRND(4):: IF M=1 AND L<>1 TH
EN GOSUB 650 :: GOTO 320
570 GOTO 320
580 CALL CHAR(116,C1$):: CALL CHAR
(120,C2$):: CALL CHAR(124,C3$)
590 CALL SPRITE(#2,116,5,120,96,0,
PV,#3,120,5,120,128,0,PV,#4,12
4,5,120,160,0,PV)
600 RETURN
610 REM
620 FOR I=2 TO 3 :: CALL SPRITE(#I
,128,9,112,(I*64+8)-20,0,-20):
: NEXT I
630 RETURN
640 CALL SPRITE(#2,44,5,104,240,0,
20,#3,44,7,104,160,0,20):: RET
URN
650 CALL SPRITE(#7,140,10,59,120,0
,10):: RETURN
660 CALL SPRITE(#10,132,16,96,216)
:: RETURN
670 CALL CHAR(116,"000C3A071F"&X$&
"00030605030000000B0C0C0C0C0C0C
2C4C8FEC73FFF")
680 CALL SPRITE(#2,116,INT(RND*9)+
2,14*8,INT(RND*14)*8+100,0,SV)
:: RETURN
690 CALL CHAR(116,"00000900240627 2
735355D6AA2E6955A40200020B0B0F
8F8FAED6D89BF96B59")
700 CALL SPRITE(#2,116,7,14*8,INT(
RND*14)*8+100):: RETURN
710 CALL KEY(0,V,CV):: IF CV<>0 TH
EN CALL MOTION(#1,0,0):: CALL
POSITION(#1,X,Y):: CALL LOCATE
(#1,13*8,Y):: CV,V=0 :: GOTO 3
20
720 TE=2 :: GOTO 860
730 CALL SOUND(500,500,1,504,2,508
,3):: CALL DELSPRITE(#10):: SC
=SC+250 :: DISPLAY AT(1,1)SIZE
(LEN(STR$(SC))+1):SC :: CALL V
CHAR(1,3,33)
740 RETURN
750 REM
760 T,ST=0 :: CALL MOTION(#1,0,0)
770 FOR I=510 TO 110 STEP -100 ::
CALL SOUND(1,I,1,I+2,2,I+4,3):
: NEXT I
780 GUY=GUY-1 :: DISPLAY AT(2,1)SI
ZE(-2):GUY :: CALL VCHAR(2,3,3
3):: IF GUY<>0 THEN CALL LOCAT
E(#1,104,45):: GOTO 330
790 CALL SOUND(2300,220,1,222,2,22
4,3):: CALL CLEAR :: CALL CHAR
SET :: IF EA=1 THEN CALL DELSP
RITE(#2,#3)
800 A$(1)=B$&"ALL YOUR MEN WERE DE
STROYED AND YOU ONLY SCORED "&
STR$(SC)&" POINTS."
810 A$(2)=B$&"BETTER LUCK NEXT TIM
E."
820 A$(3)=B$&"WANT TO PLAY AGAIN?
(Y OR N)"
830 TE=1 :: GOSUB 1460
840 CALL KEY(0,K,STAT):: IF NOT(K=
89 OR K=78)THEN 840 ELSE IF K=
78 THEN STOP
850 CALL DELSPRITE(ALL):: TIME=2 :
: PV=0 :: GOTO 260
860 READ TP,FR :: ON FR GOTO 880,8
90,900,870
870 RESTORE 910 :: GOTO 860
880 CALL SOUND(100,TP,1,TP+2,2,TP+
3,3):: CALL SOUND(100,165,1,19
6,1,262,1):: ON TE GOTO 1480,7
10
890 CALL SOUND(100,TP,1,TP+2,2,TP+
4,3):: CALL SOUND(100,175,1,22
0,1,262,1):: ON TE GOTO 1480,7
10
900 CALL SOUND(100,TP,1,TP+2,2,TP+
4,3):: CALL SOUND(100,196,1,24
7,1,294,1):: ON TE GOTO 1480,7
10
910 DATA 262,1,330,1,392,1,440,1,4
66,1,370,1,392,1,330,1,349,2,4
40,2,523,2,587,2,622,2
920 DATA 494,2,523,2,440,2,392,3,4
94,3,587,3,659,3,698,3,554,3,5
87,3,494,3
930 DATA 349,2,440,2,523,2,587,2,6
22,2,494,2,523,2,440,2,262,1,3
30,1,392,1,440,1,466,1
940 DATA 370,1,392,1,330,1,262,1,1
96,1,262,1,196,1,262,1,196,1,2
62,1,262,1,294,1,330,1
950 DATA 349,2,262,2,349,2,262,2,3
49,2,262,2,349,2,349,2,330,2,2
94,2,262,1,196,1,4,4
960 VD=28 :: Z$=RPT$("0",16):: CAL
L CHAR(140,"000001010F09090901
0101013E200000C0C4C4FCC0C0C0C0
C020100808102030")
970 C1$=RPT$("0",13)&"31FFF1F03"&R
PT$("0",20)&"C"&RPT$("F",11)
980 C2$=RPT$("0",7)&"3"&RPT$("F",1
8)&"03"&RPT$("0",10)&"C0"&RPT$
("F",18)
990 C3$=RPT$("0",10)&"FC"&RPT$("F"
,11)&"C0000"&Z$&"C0FBFFFBF"
1000 C=96 :: C2=104 :: X$=RPT$("0",
12):: Y=6 :: CALL CLEAR :: DIS
PLAY AT(12,1):"PRESS ANY KEY T
O STOP        ANY GRAPHICS DISP
LAYS."
1010 FOR D=1 TO 500 :: NEXT D :: CA
LL SCREEN(2):: CALL CHAR(36,X$
&"000C1F1C1C1C0C0C0702"&Z$&"01
02FCCB9084BB131654"):: CALL CL
EAR
```

Continued on p. 42

COMPUTER CONNECTION I

DOT MATRIX PRINTERS
GEMINI 10" X-SERIES $325
GEMINI 15" $515

(Letter Quality) SMITH CORONA $498
After $50 manufacturer rebate $448
(Thermal 80 column) STX-80 $169
RS232 card $125
(Required cable for printers $32)
(See 99'er HCM Feb '83 printer review)

Amdek 13" Color I Monitor & cable $298

Disk Drive (only) $184
Controller (only) $192
Disk Drive & Controller $368
(Peripheral expansion box required)

Ten SCOTCH 3M 10 minute tapes $14
Ten Maxell single sided density Diskettes $26
Also Available:
TI-Compatible Software

Normal delivery is 1 to 2 weeks for cashier & money orders. Personal checks are 10 days longer Ohio residents add 6.5% Sales tax Add 3% shipping charge $3 minimum

We specialize in service

Mail Order to:

COMPUTER CONNECTION I
P. O. Box 02453
CLEVELAND, OHIO 44102
(216) 961-7311

SEND $2 FOR A COMPLETE PRICE LIST.
Send bid requests on special orders or quantity pricing.

PEGASUS SOFTWARE

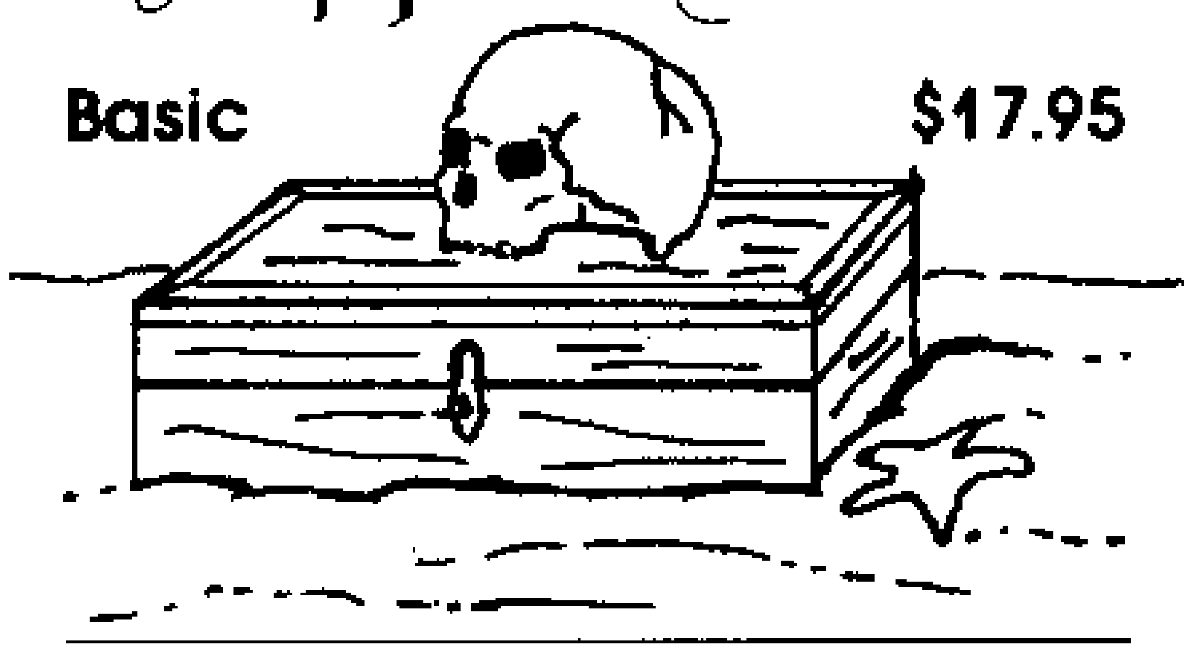
Quality Software for your TI-99/4(A)

The shark filled waters of the Bermuda Triangle is the setting for this exciting text adventure.

With only one air tank, you must make your way past hungry sharks and a grasping octopus as you recover Spanish gold from the ancient

Ship of Doom

Basic **$17.95**



All games on cassette.
PPd. Send check or money order to:
PEGASUS SOFTWARE
1438 38th Avenue
Greeley, CO 80634

CP/M®

PROCESSOR FOR THE TEXAS INSTRUMENTS 99/4A

NOW YOUR TI-99/4A REALLY MEANS BUSINESS.

Morning Star Software introduces the CP/M Processor for the TI-99/4A. Now the advantages of the most accepted business programs are yours. With the CP/M Processor, your TI-99/4A is ready to enter the business world.

The Morning Star Software CP/M Processor fits into your peripheral expansion system like any expansion card. It's as simple as that. Once the CP/M Processor is activated, you have all the advantages of two processors: The CP/M Processor handles all the program computations, while the TI Processor channels the information to the screen, disks and printers. This gives you the flexibility you've always wanted.

CP/M is the industry standard business format for computers today. CP/M offers you the advantage of working with programs that were designed to meet the needs of the professional business world. Powerful commands, time saving functions and proven methods are the result.

The CP/M Processor by Morning Star is built to take advantage of both the TI computer and CP/M technology. The CP/M Processor contains a 5MHz 8085 CPU which, with the 16-bit TI-9900 CPU, translates to tremendous processing power. Your TI-99/4A combined with the CP/M processor becomes a true business tool at a fraction of the expense of a new computer system.

THE MORNING STAR CP/M PROCESSOR **$595**

- Needs no modifications to the TI 99/4A system.
- 64K RAM, 8K ROM.
- Makes additional use of the TI 32K memory expansion.
- Supplemental installation and usage manual included.
- Contains sufficient memory for virtually all programs.
- Compatible with TI-99/4A storage diskettes.
- Provides 60K transient program area.
- Fully burned-in and test cycled to ensure reliability.
- Fully shielded and protective metal enclosure.
- Ultra-reliable gold connector assembly.
- No chip sockets for better reliability.
- 90-day warranty.
- CP/M disk-based operating system included.
- Digital Research™ CP/M user's manual included.
- Access to more than 10,000 commercially available software packages.

COMPATIBLE CP/M® SOFTWARE

CBASIC® INTERPRETER

The language of choice for many CP/M compatible software packages. This brings you a variety of established and time tested applications and allows you to write your own CP/M compatible programs. **$150**

BUSINESS MASTER® PLUS

A comprehensive business package designed to meet the needs of leading businesses. The package of 10 diskettes includes General Ledger, Payroll, Fixed Assets Accounting, Accounts Receivable, Accounts Payable, Inventory, and Mailing List programs. Requires CBASIC Interpretor. **$289**

SPECIAL OFFER: SAVE $100

The combination of CBASIC® Interpreter and Business Master® Plus is one of the most advanced program packages available for any small computer. It features full menu control, easy data entry/edit, and advanced B-Tree file indexing. The Business Master® Plus is the most professional business and accounting package available for the TI computer. Special offer valid through September 30, 1983.

CBASIC INTERPRETER AND BUSINESS MASTER® PLUS **$339**

TO ORDER: Check, Money Order, Master Card, VISA, and C.O.D. orders accepted. Add $5.00 shipping and handling.

MORNING STAR SOFTWARE

4325 S.W. 109th Ave., Beaverton, Oregon 97005, Toll-Free 1-800-824-2412, In Oregon 503/646-4695, TEX NET NO. TI3416

Peripheral Requirements: Peripheral Expansion System, disc, disc controller 32K RAM card.

CP/M and CBASIC are registered trademarks of Digital Research. Texas Instruments is a registered trademark of Texas Instruments, Inc.
Business Master is a registered trademark of Business Master, Inc.

PERIPHERAL VISION 99

The choice in microcomputer peripherals keeps getting better all the time—helping you to get more out of your Home Computer. In this review feature, *99'er HCM* will look at new hardware products that we feel can expand our readers' peripheral vision.

STX-80 Thermal Printer

Star Micronics, Inc.
200 Park Avenue
New York, NY 10166

$199.00 with Parallel Interface
(Serial interface not yet available)
$9.95 for two rolls of thermal paper
(200 feet)

NOTE: The cable you use to connect the STX-80 parallel port to the TI parallel port must connect STX-80 pin 11 to TI pin 10, and STX-80 pin 16 to TI pin 11. If your cable is not configured this way at present, it must be modified.

A quality printer for under $200? Just a year or two ago, the idea would have seemed impossible. But now that we've seen Star Micronics' new STX-80, we are reminded again that good things can indeed come in small packages.

The first thing you notice about the STX-80 is that it takes up only about half the space of most other printers. Weighing 7.5 lbs and measuring 14" by 7.5" by 4", it's a compact package.

At 60 characters per second, the STX-80 is almost as fast as many of the more costly printers. Like those more expensive models, it is bi-directional, logic seeking, and allows bit-image graphics programming. Because it uses thermal paper, it is quieter than dot matrix impact printers, many of which can be quite noisy.

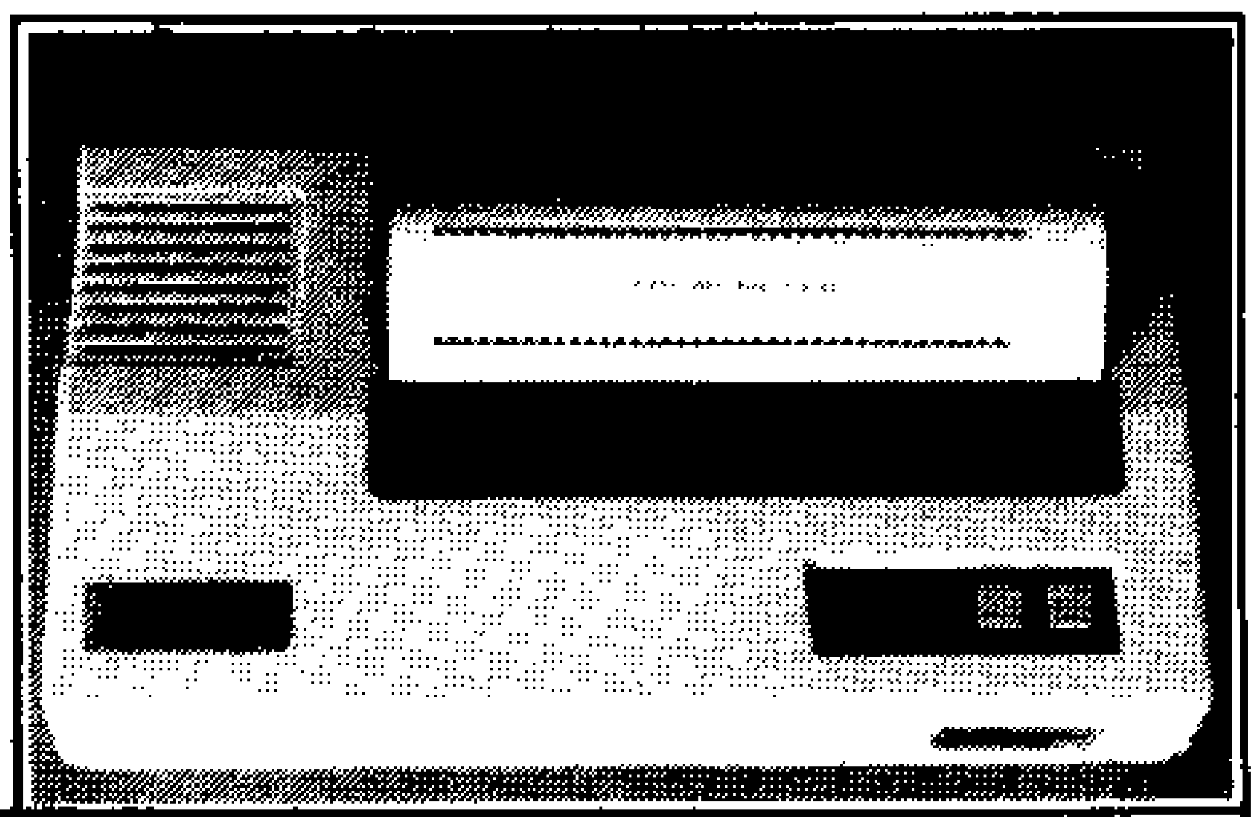
Loading is extremely simple, using thermal paper which comes on a 100-foot roll. Just drop in the roll, feed the paper into the inlet, and you're ready to print. Personally, I find this paper's tendency to curl up a bit annoying, but it can be flattened, and the print does photocopy well. It is about five times as expensive as the non-thermal paper, but this cost is partly negated because the STX-80 has no ribbon cartridge to replace periodically.

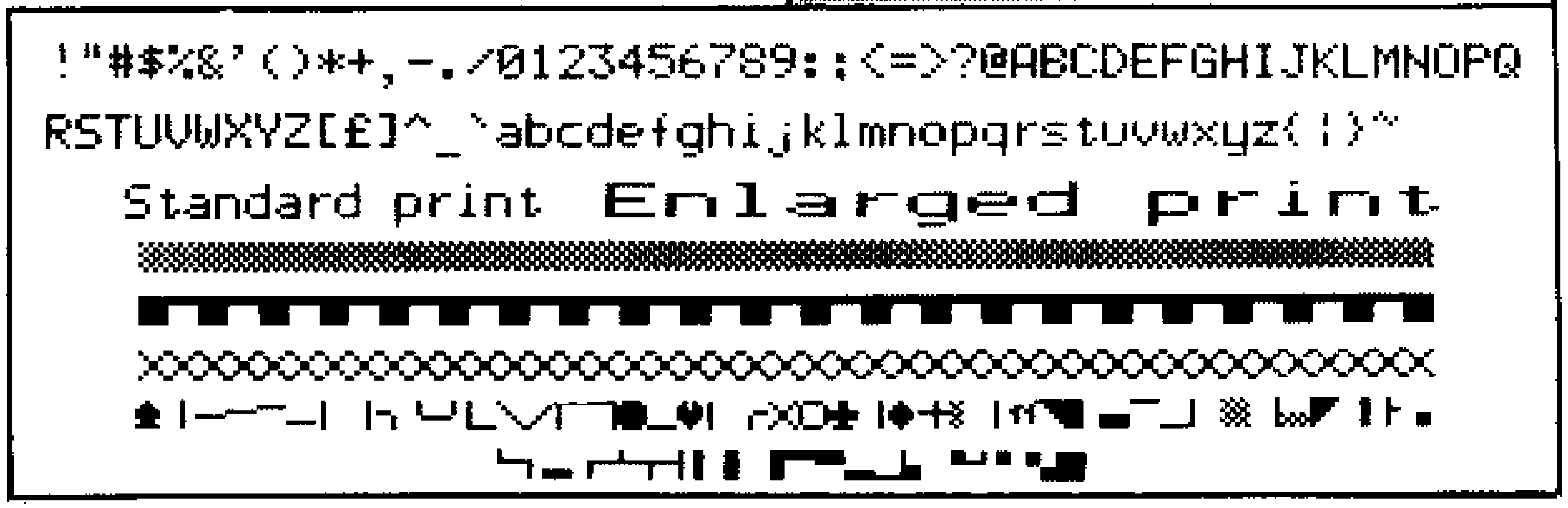
The most surprising thing about this low-cost printer is the high quality of print. Its resolution and tracking are at least as good as that of a dot matrix impact printer, which may be three or four times as expensive. In normal print mode, which uses a 5 × 9 matrix, the characters are clear and readable with the preferred true descenders (full-length tails on the p's and q's). The STX-80 also features enlarged printing and a bit-image graphics mode, using a 6 × 6 matrix, as well as a standard set of block graphics. All of the borders shown in the box were generated using the standard block characters and a few lines of code. Even the finest patterns are printed with a high degree of precision.

Our STX-80 came with a preliminary users' manual which was adequate for us, but would not be very helpful to someone who needs help in setting printing control codes—especially for the graphics mode. We hope the production version of the manual will be more in line with the general quality of the printer.

We were pleased to see that Star Micronics chose not to sacrifice quality in bringing the price of line printers under $200. The STX-80 is quick, precise, very quiet and easy to use. For someone looking for these features, the STX-80 compares well with any printer, at any price.

—Will Schick





```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
RSTUVWXYZ[£]^_`abcdefghijklmnopqrstuvwxyz{|}~
   Standard print  Enlarged  print
```

COMPU • SETTE®
TAPES & DISKS

C-10's 39¢ ea. (min. lot of 500) w/ labels add 4¢ w/ boxes add 13¢

- 100% Error-Free
- Fully Guaranteed
- Used by Hobbyists, software firms and school districts nationwide

Cassettes	12-pak	24-pak
C-05	.79	.69
C-10	.89	.79
C-20	.99	.89
C-30	1.29	1.19
Custom Case	.26	.21

5¼ inch Diskettes	Mini 5-Pak	Std. 10-Pak
SS/DD	14.95	26.95
Custom Case, Add		3.00

— Specify your computer system —

UPS SHIPPING
$3.00 per pak
Canadians Multiply by 2

TOLL-FREE
(for orders only)
1-800-528-6050
Ext. 3005
— In Arizona —
1-800-352-0458
Ext. 3005

MICRO-80 INC.
2665-T Busby Road
Oak Harbor, WA 98277
1-(206)-675-6143

EDUCATION+GAMES+UTILITIES
CHALLENGING SOFTWARE
EXCITING GRAPHICS & SPEECH

Burger Hunt Chase thru space in search of the elusive burgers **$19.95** (1-2 player)

Tag Runner Catch your opponent as you chase thru the poison garden **$19.95** (2 player)

Utility 1 Sprite encoder; speech decoder; hex-decimal decoder + much more **$29.95**

Intro to Pre-School Learning **$19.95**
Learn shapes, body parts, the alphabet & numbers

Elem Reading & Spelling Skills
Introduces letter sounds, builds words & sentences
(speech required)
5 levels/each level **$23.95** 5 level packet **$99.95**

Elementary Math Skills
Number identification & counting thru +, −, x, ÷
5 levels/each level **$23.95** 5 level packet **$99.95**

X Basic required ● Speech optional
Specify cassette or disk ● Dealer inquiries welcome
Coming soon! Machine Language Programs
To order send check or money order — Brochure upon request

10175 SW Barbur Blvd.
Suite 300B
Portland, OR 97219

Star Design Systems

PLASTIC LAMINATE

Computer Desk - $185.00
26"H x 24"D x 42"W
Monitor Stand - 35.00
9"H x 12"D x 22"W

Computer Desk - $195.00
26"H x 24"D x 48"W
Drawer Unit - 85.00
Left or Right Mounting
12"H x 16"D x 14"W

OAK OR WALNUT

Computer Desk $245.00
26"H x 24"D x 42"W
Monitor Stand - 45.00
9"H x 12"D x 22"W

Printer Table - $235.00
Front or Rear Loading
23"H x 24"D x 29"W

Printer Table - $175.00
Front or Rear Loading
23"H x 24"D x 29"W

STAR DESIGN SYSTEMS of Portland, Oregon is offering a complete line of fine furniture for your office or home.

All our furniture is totally knock down for convenient shipment directly to you and easily assembled with an allen wrench (included) and screwdriver.

Our furniture is offered in a plastic laminate finish in four distinct colors with color coordinated non-chip edges or in oak or walnut veneers with solid wood edges, stained respectively in a Golden Oak or Dark Walnut with a Tung Oil finish.

We use only the finest materials available and pride ourselves in workmanship and quality of our furniture.

Plastic laminate colors: Finnish Oak, Desert Beige and Walnut with Dark Brown edging and Fog Grey with Black edging.

When ordering please state plastic laminate or wood, unit desired, color, quantity and price. When ordering drawer unit please state left or right side mounting.

Please allow 4 to 6 weeks for delivery. All prices include freight. Dealer inquiries welcome.

To purchase send cashiers check or money order, or for more informaiton write or call:

STAR DESIGN SYSTEMS
344 N.E. 28th St. • Portland, OR 97232
(503) 232-1564

Super Frog

"A Hopping Good Game"

Fastpaced, 1 or 2 player game — incorporating many arcade features plus exciting color graphics.

- 4-Starting level options.
- 4-Speed level options.
- 6-Advancing skill levels.
- No set pattern - randomly placed characters.
- Bonus Frogs Awarded.

X-tra Feature

Press Fire button to use accumulated points making "Super Frog" indestructable.

Specify Joystick or Keyboard.
Ext. Basic Quality Cassettes only $15.95, includes postage and handling.
Please send Check or Money Order to:

Gem Software
8336 Cheviot Road
Cincinnati, Ohio 45239

NEW from
Oak Tree Systems

. SUPER CHECKBOOK -
THE checkbook manager written for maximum convenience using many features of our 40-column DISPLAY ENHANCEMENT PACKAGE.
Reqs. Disk, X-BASIC, 32K $19.95

. DISPLAY ENHANCEMENT PACKAGE -
40-column display & much more with BASIC or Extended BASIC programs. Disk version reqs. 32K Expansion and either Editor/Assm. or X-BASIC or Mini-Memory. Tape version reqs. 32K Expansion and Mini-Mem. $29.95

. SMASH - The Extended BASIC program optimizer. Disk, X-BASIC. $24.95

3922 Valentine Road
Whitmore Lake, MI. 48189

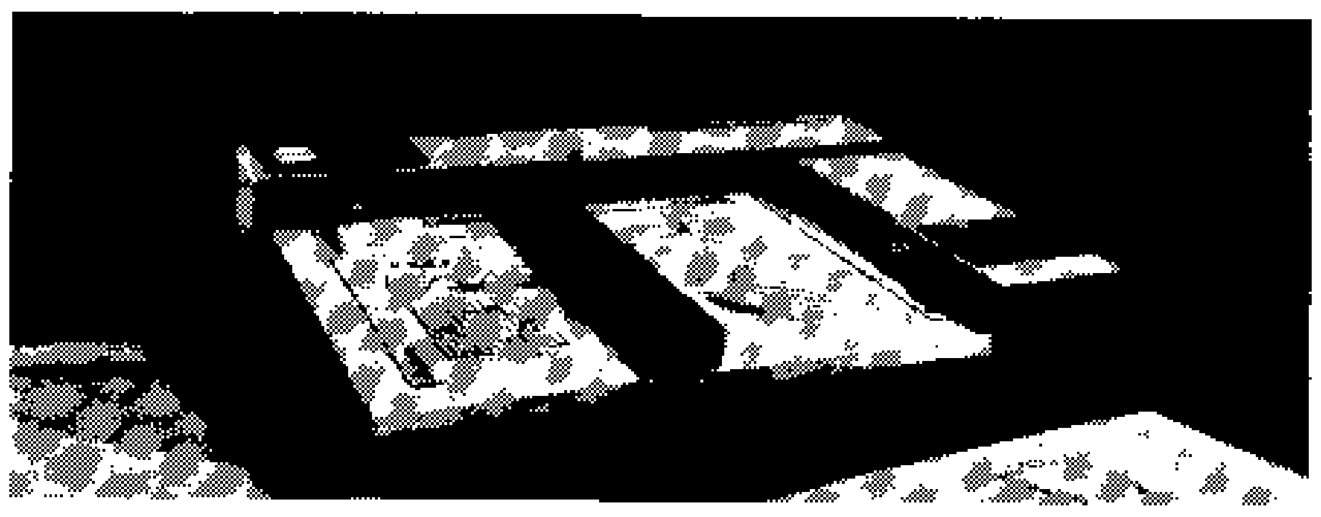
Jungle Jim . . . from p. 39

```
1020 CALL CHAR(136,"0001071F3FFFFFF
     F0080E0FEFFFFFFFF000020F0FCFFF
     FFF10183C7C7EFEFFFF")
1030 CALL MAGNIFY(4):: CALL SPRITE(
     #28,140,16,10*8,15*8)
1040 CALL CHARSET :: FOR I=1 TO 14
     :: CALL COLOR(I,14,1):: NEXT I
      :: DISPLAY AT(1,9):"JUNGLE JI
     M"
1050 B$=RPT$(" ",28)
1060 CALL CHAR(132,"18245ADBDB5D241
     80"&Z$&Z$)
1070 A$(1)=B$&"99'ER MAGAZINE PRESE
     NTS . . . J U N G L E  J I M !
       "
1080 A$(2)=B$&"YOU MUST JUMP OVER T
     HE OBSTACLES BY PRESSING 'I'.
      TO MOVE, USE THE LEFT AND RIG
     HT ARROW KEYS."
1090 A$(3)=B$&"YOU GET 4 MEN, AND Y
     OU SCORE POINTS BY GRABBING TH
     E DIAMOND."
1100 RESTORE 910 :: TE=1 :: GOSUB 1
     460
1110 CALL VCHAR(1,1,32,768):: CALL
     DELSPRITE(ALL)
1120 GUY=4 :: SC=0
1130 CALL CHAR(80,"00183C3E3F1F0F02
     061F3F3F3E3E10000001C3E7EFEFC
     7870F8FCFCBCBC888")
1140 CALL CHAR(88,"000000000000607030
     04090A0EAFFFFFF80808090B8F8F0E
     08182AAAB5FFFFFFFFFF")
1150 FOR I=1 TO 14 :: CALL COLOR(I,
     1,1):: NEXT I
1160 CALL CHAR(140,"00010F0F0F13162
     A29"&RPT$("20",5)&"A0E01CF4DEC
     6E03030282824"&RPT$("0",12))
1170 CALL CHAR(128,Z$&"010307040808
     0B070000003C7C7CFCFBF0F0E04040
     408")
1180 CALL CHAR(33,RPT$("F",16)):: C
     ALL COLOR(1,1,1):: CALL HCHAR(
     1,1,33,32*9)
1190 CALL CHAR(34,"FFFFFFFFFF7F3F07
     07030303070707 01FF7F1F1F070301
     00FFFFFFFEFCFCFCFC")
1200 CALL CHAR(38,"F0F0F0E")
1210 DATA 7,1,34,8,1,35,9,2,36,8,6,
     37,9,6,38
1220 FOR D=1 TO 30 STEP 6
1230 RESTORE 1210
1240 CALL HCHAR(9,D+1,32):: FOR I=1
      TO 5 :: READ A,B,C :: CALL HC
     HAR(A,B+D,C):: NEXT I
1250 NEXT D
1260 CALL VCHAR(7,1,32,3):: CALL VC
     HAR(7,32,32,3):: CALL SCREEN(6
     )
1270 CALL CHAR(40,"030307070F1F7"&
     PT$("F",19)&"80C0C0E0E0F0F8FF
     )
1280 DATA 10,3,41,4,10,4,41,4,13,2,
     40,1,13,5,42,1
1290 CALL CHAR(44,"01017F130F03030
     03030204043B20000084FE84F0888
     8080C0201010101018")
1300 CALL CHAR(58,RPT$("F",16)):: C
     ALL HCHAR(11,1,58,32*13)
1310 FOR D=1 TO 32 STEP 4
1320 CALL HCHAR(14,D+2,88):: CALL H
     CHAR(14,D,89):: CALL HCHAR(14,
     D+3,90):: CALL HCHAR(14,D+1,9
     ):: NEXT D
1330 FOR F=1 TO 30 STEP 6 :: RESTOR
     E 1280
1340 FOR I=1 TO 4 :: READ A,B,C,D :
     : CALL VCHAR(A,B+F+1,C,D):: NE
     XT I
1350 NEXT F
1360 FOR D=1 TO 32 STEP 2 :: CALL H
     CHAR(21,D,80):: CALL HCHAR(22,
     D,81):: CALL HCHAR(21,D+1,82):
     : CALL HCHAR(22,D+1,83)
1370 CALL HCHAR(23,D,88):: CALL HCH
     AR(24,D,89):: CALL HCHAR(23,D+
     1,90):: CALL HCHAR(24,D+1,91):
     : NEXT D
1380 CALL CHAR(92,"000001010F09090
     010101013E200000C0C4C4FCC0C0C
     C0C020100808102030")
1390 CALL MAGNIFY(4):: IF TIME<>1 T
     HEN RETURN
1400 CALL CHAR(96,"0101031F131313
     0303033F2000000080888888F8808
     808080000080402030")
1410 CALL CHAR(100,"00000101070909
     5010101010618100 0C0C0C2F4C8C0
     0C0C02010080810203")
1420 CALL CHAR(104,"00000101070503
     10101010102020203C0C0C0E0E0F8
     0C0C02020101020406")
1430 CALL CHAR(108,"00000103030303
     10101010000070400C0C0C0E0E0E0F
     0C0C04040C0C0A080C")
1440 CALL CHAR(112,"00000101070909
     50101000007040000C0C0C0E0E0F8
     0C0C040C040A010203")
1450 RETURN
1460 CALL CHAR(120,X$&"FF")
1470 CALL HCHAR(5,1,120,32):: FOR D
     =1 TO 3 :: FOR I=1 TO LEN(A$(D
     ))STEP 3 :: F$=SEG$(A$(D),I,2
     ):: DISPLAY AT(4,1):F$ :: GOTO
      860
1480 CALL KEY(0,T,S):: IF S=0 THEN
     1490 ELSE 1500
1490 NEXT I :: NEXT D
1500 CALL VCHAR(1,1,32,768):: RETUR
     N
```

TENEX™ Super Buys

TENEX, Box 6578, South Bend, IN 46660 Questions: (219) 277-7726 To Order: (800) 348-2778

Plotter Price Breakthrough!



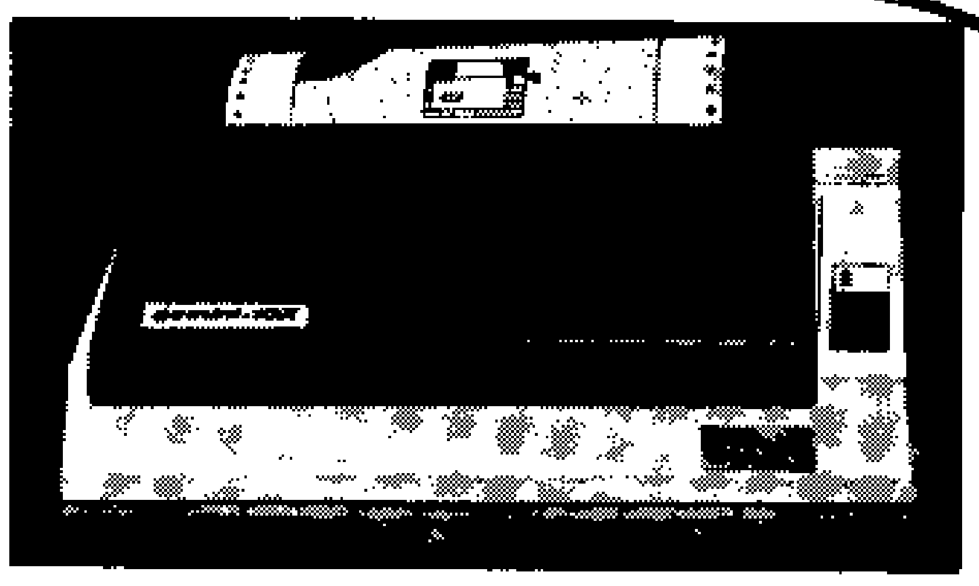
$699

Engineers! Businessmen! Educators! Now you can produce professional hard-copy graphics in minutes with the affordable Amdek DXY plotter and your personal computer. With features previously available only in plotters costing thousands of dollars, the DXY interfaces directly with your computer's parallel output to draw over a 10" x 14" area at speeds up to 70 mm/sec with 0.1 mm resolution!

Improve your presentations and lectures by producing graphs and transparencies with this new technology plotter. The Amdek DXY comes complete with built-in ROM to interpret BASIC commands plus full ANSCII character set. Extra color pens, penholders, dustcover, and instruction book are included. **Now Only $699.00**

TI Interface cable for Amdek Plotter (contains required exclusive interface electronics and connects to parallel port of RS-232 card). **Only $37.95**

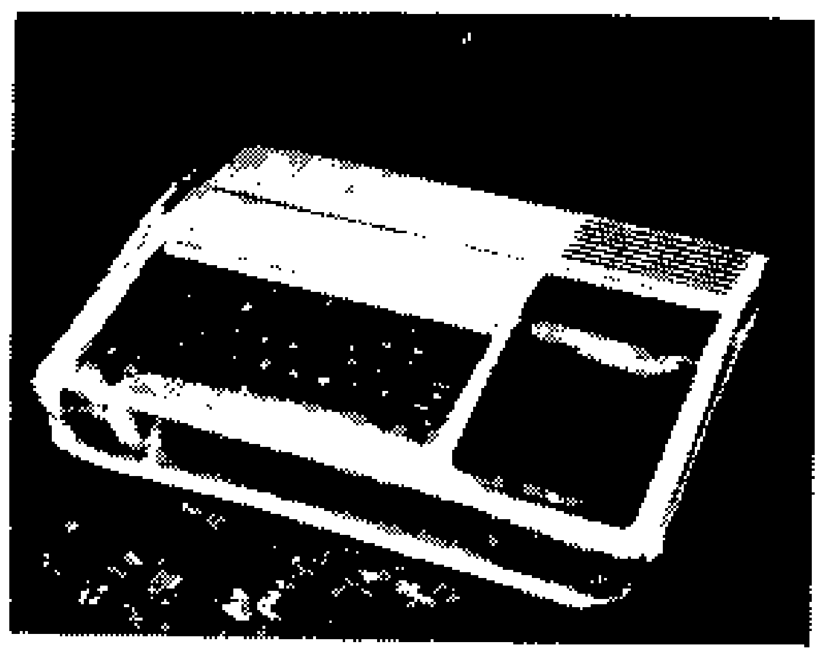
Gemini 10X Printer



This major advance in the technology of dot matrix printing is totally compatible with your 99/4A system. The latest from amazing Star Micronics features friction or tractor feed, 120 character/sec bidirectional printing, plus a super resolution 9x9 matrix with true descenders! Built-in character fonts include normal, elite, condensed, enlarged, emphasized, double strike, italics, AND super and subscript.

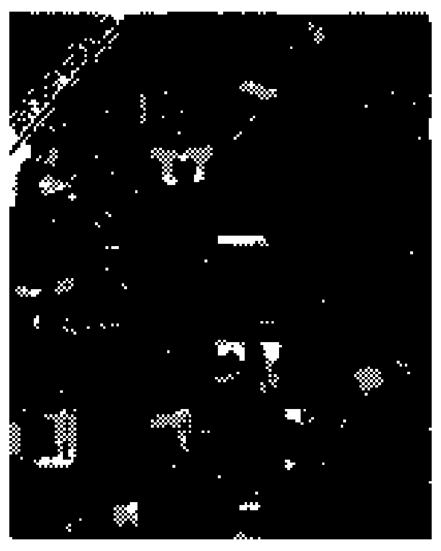
The Gemini 10X has more features than any other printer in its class: block graphic and downloadable characters, bit image/graphics, ultra-high resolution, vertical and horizontal tabs, skip-over-perforations, and much more. Truly a superb quality printer! **Now Only $329.00**

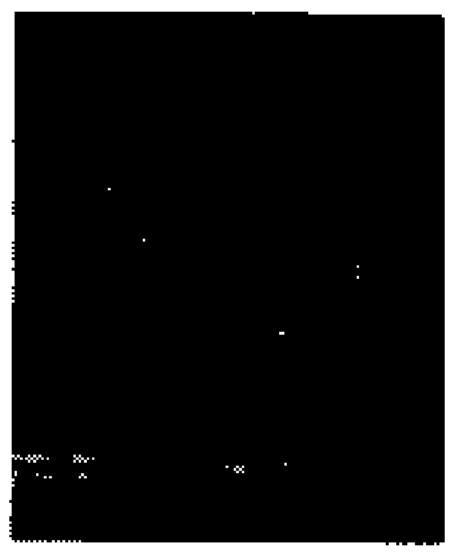
CONSOLE COVER SPECIAL!



Protect your investment! TENEX best quality, translucent, anti-static vinyl cover for your TI 99/4A console. Exclusive rear corner slit allows for cables and speech synthesizer.

Now Only 4.95



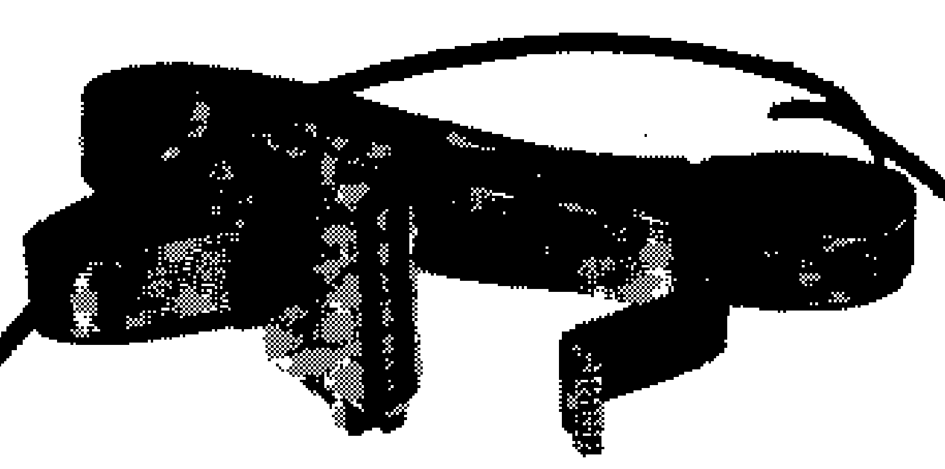


TI BOOKS

Kids & the TI-99/4A by Edward H. Carlson. Learning BASIC can be great FUN! You'll be writing your own programs by lesson five and forever after. Sample programs are easy to understand. Computer graphics and drawings in full color! 236 pages, softcover, spiral bound. For 7th grade and up. **Only $19.95**

Using & Programming the TI-99/4A Including Ready-to-Run Programs by Frederick Holtz. The complete hands-on guide for all phases of TI-99/4A operation. Includes 12 ready-to-run programs plus all you need to start writing your own programs. 216 pages, softcover. **Only $9.95**

PRINTER CABLES!



Parallel cable to connect Gemini 10X and other Star Micronics, Epson or Prowriter to TI's RS-232 Interface Card's parallel port.	$24.95
Okidata or TP-1 Parallel cable	$37.95
RS-232 Serial Cable	$24.95

All TENEX printer cables are guaranteed! Specify printer make and model number when ordering.

FREE!

The Everything Book for the TI 99/4A Home Computer can be yours FREE! It has TENEX's complete selection of software, peripherals and accessories, all compatible with the TI home computer family. Over 600 quality programs for entertainment, education and business.

Buy with confidence from TENEX!

©1983, TENEX

☐ Send "The Everything Book for the TI Home Computer" and put me on your mailing list. NO ORDER REQUIRED.

MAIL ME TODAY!

Name ________________

Address ________________

City ________________

State ________________ Zip ________

Telephone (______) ________________

Pay By: ☐ Check ☐ Money Order

☐ Visa ☐ MasterCard

Card No. ________________

Expiration Date ________________

MAIL TO: TENEX, Box 6578
South Bend, IN 46660
Questions: (219) 277-7726
To Order: (800) 348-2778

QTY.	ITEM DESCRIPTION	AMOUNT
	Shipping & Handling	1.75
	5% Tax for Indiana Residents	
	TOTAL	

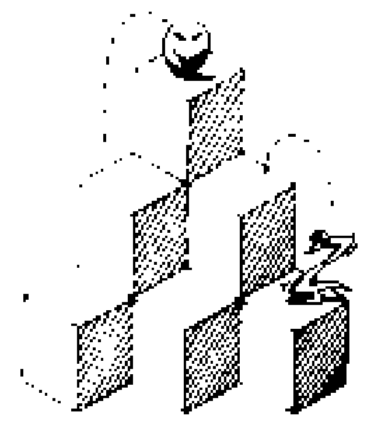
TEXWARE ASSOCIATES
PRESENTS
Innovative, Educational and Entertainment Software for the TI 99/4A

The Game of WIT

S
K
WIT
L
VOCABULARY

Test your skill and vocabulary with this exciting word game. Build words connecting to other words using crossword strategy. This game which improves your logic and vocabulary skills is for people who enjoy a challenge. Played on a multicolored computer screen board. First in a series of five "Wit" games. The second game, "Wit's End", will be released in September. Uses KEYBOARD only. No joysticks needed. Available only in EXTENDED BASIC for $16.95.

Z—BURT



Move your Z-Burt around the pyramid as fast as you can. Change all the colored squares four times to reach the next level. An additional monster or hazard appears every other level. Bonus Z-Burts awarded for every level completed. Each new level is more difficult than the last. Caution: This game can be habit forming!! JOYSTICKS AND SPEECH SYNTHESIZER ARE OPTIONAL. Available only in EXTENDED BASIC for $17.95

All games available on cassette. Z-Burt, The Game of WIT also available on disk. Specify choice

FRAZZLE

You are a Fwipple in the evil sorcerer's vast treasure chambers. The treasure is not just for the taking, however. He has divided the treasure into over 50 different rooms, each room guarded by a ghoulish guard, ever approaching force fields, and a powerful door. To get the most treasure and still survive will require careful strategy and split second decisions. Becomes progressively more difficult with each new room. JOYSTICKS ARE REQUIRED. Available only in EXTENDED BASIC for $15.95.

To save C.O.D. charge, send check or money order. Illinois residents add 5% state sales tax. Send to:

TEXWARE ASSOCIATES
350 FIRST NORTH ST.
WELLINGTON, IL 60973

מ✡מ

HEBREW LANGUAGE AND
JEWISH EDUCATIONAL
TI XBASIC CASSETTE PGMS
HR/1 - ALEPHBET DEMO & QUIZ
HR/2 - CONSONANTS & VOWELS
HR/3 - SYLLABLES & "WORDS"
HR/4 - HEBREW TYPEWRITER PGM
HL/1 to 4.......
UNDERSTANDING PRAYER &
BIBLICAL HEBREW -
THE SH'MA - PTS I to IV
HS/1 - JEWISH TIME MACHINE-I
HS/2 - JEWISH TIME MACHINE-II
HS/3 - ARCHAEOLOGICAL DIG GAME
HS/4 - ISRAEL GEOGRAPHY GAME
$19.95 ea. / $49.95 any 3
Free Catalogue
MICRO-MELAMED SOFTWARE
6130 CORALRIDGE DRIVE
CORPUS CHRISTI, TX 78413

CUMBERLAND TECHNOLOGY
10 Wagner Drive
Carlisle, PA 17013

99/4(A) Programs

- ENGINEERING
- MATH
- PROGRAMMING AIDS
- GAMES
- Many programs written in Assembly Language

Please send name and address for a current list

Success Formula . . . from p. 33

beginning, and you will be forced to rely on chance until you acquire experience. As the game nears its completion, you will be making more decisions, but sometimes, as in real life, you will still have to take a chance and live with the outcome. The game can be won or lost right up to the final turn.

As with an adventure game, it is more fun to play the game cold—learning as you go and building on what you've learned. But a few things should be noted.

Opportunity Knocks

Think of your potential experience as a stack of randomly shuffled cards each numbered 1, 2 or 3. You will be given the opportunity to draw "cards" from the stack at various times during the game. An experience "card" gives you the option of advancing 1, 2, or 3 squares on the gameboards instead of taking a chance. You trade in your cards as you use them, and you are allowed to hold only five cards of each value at any time during the game. You will be given an experience value of zero if you draw a sixth card of the same value as any of the five you are currently holding. You may receive experience as a result of landing on the first three squares in any sideboard, and for successfully completing any of the five occupation sideboards. You will also get a card for the "experience" of going to court or being drafted into the army.

Winning or Losing the Game

You win the game by achieving or exceeding all three parts of your Success Formula before your 41st birthday. You lose by not meeting your objectives, or by get-

Success Formula
Explanation of the Program

Lines Nos.	
100-180	Program header, and title display routine.
190-330	Dimensions and initializes variables, and sets character graphics patterns and colors.
340-420	Routine to read DATA from cassette.
430-750	Inputs player's success formula.
760-860	Control loop for the 21 mainboard squares.
870-1090	"Opportunity Knocks" routine.
1100-1160	Routine to adjust experience.
1170-1260	"Drafted into the Army" routine.
1270-1290	Time delay subroutine.
1300-1370	Routine to display message on the screen without scrolling.
1380-1610	Routine to display the rolling of the dice.
1620-1780	Payday routine.
1790-2350	Display the mainboard and options, and input choice. Display winning message.
2360-2490	Routine to enter sideboards.
2500-2590	Chance routine.
2600-2640	"Not enough cash" routine.
2650-2940	College sideboard.
2950-3000	Science sideboard.
3010-3060	Business sideboard.
3070-3110	Teaching sideboard.
3120-3210	Politics sideboard.
3220-3320	Sports sideboard.
3330-3530	Sideboard control loop.
3540-4610	Sideboard payoff routines.
4620-5620	Mainboard routines.
5630-5730	Routine for loss at the end of the game.
5740-5760	Routine to scan the keyboard.
5770-5820	Routine to read the DATA and assign it to the array B.
5830-5870	DATA for array B to control the sideboards.
5880	END of the program.

IMPROVE & UPGRADE
YOUR 99/4A

2-IN-1
COLOR TV
AND
MONITOR

VIDEO ARCADE QUALITY
SWAP IN YOUR 99/4A
FOR
CUSTOM COMPUTER AND
2-IN-1 TV REC'V/MONITOR

$575
NJ Add Tax

HSK
P.O. BOX 131 530 Ringwood Ave.
Wanaque, NJ 07465
(201) 831-0202

HOW TO FIND THE EDUCATIONAL SOFTWARE THAT IS RIGHT FOR YOU.

DO YOU own a TI, Commodore, Timex, Atari, Apple or Radio Shack home computer?

ARE YOU frustrated by boring programs, confusing manuals or good software that's too advanced or too elementary for you?

GOOD NEWS! We are educational specialists with software from top companies like Spinnaker, The Learning Co., Scholastic, Inc. and many more.

EARN BIG discounts evaluating new software.

NO RISK: We promise to return your money immediately if you are not completely happy with your purchase.

SEND this coupon today for FREE details.

JMR ASSOCIATES
THE BEST IN EDUCATIONAL SOFTWARE
P.O. Box 804-N, Show Low, Arizona 85901

SYSTEM ____________
NAME ____________
ADDRESS ____________
CITY ________ STATE____ ZIP ______

CHARACTER GENERATOR
PROGRAMS FOR THE LOW-COST TI-99/4(A) HOME COMPUTER

VIDEO TITLES I
PRODUCE CUSTOM TITLES FOR VIDEO RECORDINGS
- 3 proportionally spaced character sets (maximum of two may be used for each title)
- Automatic centering of each title line
- Variable spacing with automatic eye correction
- 26 color combinations
- Multiple screen division with scrolling
- TI-BASIC, 16K
- $29.95 postpaid (cassette or diskette version)

VIDEO TITLES II
PRODUCE AUTOMATED SEQUENCES OF CUSTOM TITLES FOR IN-STORE ADVERTISING OR VIDEO RECORDINGS
- 3 proportionally spaced character sets
- Choice of justification (left, centered, right) for each title line
- Variable spacing with automatic eye correction
- Choice of 4 frame styles for each title
- Overlay of custom designs such as logos, etc.
- Storage of 40 titles, 40 sprite patterns and 10 title sequences
- TI-EXTENDED-BASIC, 16K
- $49.95 postpaid (diskette version only)

ORDER NOW —
- Send check or money order to: ***J & K H Software*** — Dept. E, ***2820 South Abingdon Street, Arlington, Virginia 22206***
- Call (703) 820-4131 for C.O.D. shipment ($3 extra)
- Where cassette or diskette version is available, if the customer does not specify, the cassette version will be supplied
- Virginia residents add 4% sales tax

NO RISK — 7 DAY MONEY BACK GUARANTEE

ting over your head in debt. If you must borrow more than $20,000 at any time, the game will end at the beginning of your next mainboard turn. You cannot borrow money to enter the Occupation or College sideboards, but you may borrow to satisfy any payments you must make while in the occupation paths. You may also have to borrow to pay your taxes and rent. If you lack sufficient cash-on-hand, you will also have to borrow an amount up to your annual salary to buy a new car or to invest in a hobby.

The Program

This program pushes the resident RAM of the TI-99/4A to its limits and, of necessity, is actually a combination of two programs. The main program contains all of the game logic; the *Supplemental Data* program contains the string data necessary to play the game. The data is INPUT as a data file into the main program each time the game is played.

The main program should be SAVEd on tape, then the *Supplemental Data* program should be RUN and the data file recorded on the tape at a spot just after the main program. Then, when the main program is loaded into the computer memory, the data file is ready to be INPUT as soon as the main program is RUN. Also, be sure that the [ALPHA LOCK] key is depressed on the TI-99/4A.

If you have a disk controller and disk drive attached, you must use CALL FILES(1) before running this program.

```
100 REM *SUCCESS FORMULA*
110 REM BY BUD DAVIS
120 REM 99'ER VERSION 2.10.1
130 CALL CLEAR
140 NE=1
150 @=2
160 CALL SCREEN(15)
170 M$="SUCCESS FORMULA"
180 GOSUB 1310
190 OPTION BASE 1
200 DIM S$(21),B(25),E(3),B$(6,10)
    ,E$(5)
210 CALL CHAR(100,"002277777F3E1C0
    8")
220 CALL CHAR(105,"0B0B7F3E1C36224
    1")
230 FOR C=112 TO 117
240 READ A$
250 CALL CHAR(C,A$)
260 NEXT C
270 FOR C=9 TO 11
280 READ X,Y
290 CALL COLOR(C,X,Y)
300 NEXT C
310 DATA 000000101,000020000004,00
    004000100002
320 DATA 000044000044,004400100044
    ,005400000054,7,1,16,1,2,16
330 CALL CLEAR
340 PRINT "INPUT DATA": :
350 OPEN #1:"CS1",INTERNAL,INPUT ,
    FIXED 192
360 FOR S=NE TO 6
370 INPUT #1:B$(S,NE),B$(S,@),B$(S
    ,3),B$(S,4),B$(S,5),B$(S,6),B$
    (S,7),B$(S,8),B$(S,9),B$(S,10)
380 NEXT S
390 INPUT #1:E$(NE),E$(@),E$(3),E$
    (4),E$(5),S$(NE),S$(@),S$(3),S
    $(4),S$(5),S$(6),S$(7),S$(8),S
    $(9),S$(10)
400 INPUT #1:S$(11),S$(12),S$(13),
    S$(14),S$(15),S$(16),S$(17),S$
    (18),S$(19),S$(20),S$(21)
410 CLOSE #1
420 CALL CLEAR
430 M$=" MONEY POINTS($/1000) "
440 H$=" HAPPINESS POINTS "
450 F$=" FAME POINTS "
460 PRINT "YOUR 18, AND HAVE":"GRA
    DUATED FROM HIGH SCHOOL.": : :
470 IF M>0 THEN 690
480 GOSUB 720
490 PRINT : :"ENTER YOUR SUCCESS F
    ORMULA.": :"TOTAL POINTS MUST=
    1000.": :
500 INPUT M$:Q
510 INPUT H$:HP
520 INPUT F$:FP
530 IF Q+HP+FP<>1000 THEN 490
540 Q=Q*1000
550 M$="$ "&STR$(Q)
560 H$="  "&STR$(HP)&H$
570 F$="  "&STR$(FP)&F$
580 CALL CLEAR
590 A$=""
600 GOSUB 730
610 L=18
620 N=NE
630 H=5
640 A=5000
650 M=A
660 S=0
670 PRINT : : : :
680 GOTO 460
690 PRINT "PRESS ANY KEY"
700 GOSUB 5740
```

Continued on p. 46

DEMCO'S CRAPS GAME

FEATURES:
- For TI99/4A
- Requires cassette player
- Vegas Odds on Place Bets
- Full Color Graphics
- Peppered with exciting sounds
- High stakes game
- Learn basics of CRAPS at home

TO ORDER SEND: $10.00 TO:
D.E.MOSES
16776 Bernardo Center Dr.
Suite 106B
San Diego, CA 92128

TEXTIGER®
WORD PROCESSOR

TEXTIGER gives you **POWER!** Handsome, error-free letters and reports command attention and get results. Not a good typist? All the more reason why you need **TEXTIGER**, the **COMPLETE** processor.

REQUIRES: Extended Basic Module, ANY printer. **VERSION II** requires either Cassette OR Disk. It DOES NOT REQUIRE 32K RAM EXPANSION ..... **$49.95*** **VERSION III** REQUIRES 32K RAM & DISK **$39.95***

SATISFACTION GUARANTEED OR MONEY BACK!
FREE info or borrow our VHS VIDEO TAPE.

TEXTIGER, 24433 Hawthorne Blvd. #8
Torrance, CA 90505. (213) 378-9286

*Calif. Res. Add 6.5% Tax
VISA/MC

UNISOURCE

YOUR ONE SOURCE FOR 3RD PARTY SOFTWARE, PERIPHERALS AND ACCESSORIES

CALL FOR PRINTER SPECIAL

SOFTWARE—Hundreds of programs by many authors including:

American
Chaffin
Compusoft
Data Systems
Denali Data
Extended
Fantasy
Futura
Funware
Galactic
Hall
Linear
Micro-Ed
Microcomputer
Moonbeam
Morreale
North Hills
Norton
Not-Polyoptics
Oak Tree
Patio Pacific
Pewterware
Program Design
P S
Simulsoft
AND MORE!

PERIPHERALS & ACCESSORIES—From 10MB Hard Disk Drives to dust covers . . . everything you might need for you TI Home Computer.

Anchor
Commodore
Corvus
Epson
Flip 'N File
Memorex
99'er Ware
Panasonic
Quadram
Smith Corona
Sony
Star
Tandon
Verbatim
Wico
AND MORE!

Complete listing available on request.

NEW SUPER PRINTER-GEMINI 10X

All the features of the TI & EPSON MX80 +:
- *50% faster (120 CPS)
- *3 more character fonts
- *friction/tractor feed standard
- *180-day Warranty
- *$2 replacement ribbon
- * . . . **at less than ½ the price**

CALL NOW*LIMITED SUPPLY At Super Special Price

SAVINGS—Ask about our discount program that applies to everything we sell—no minimum order.

ORDER TODAY. WE SHIP TOMORROW* OR WE PAY THE FREIGHT on any items currently in production.

*Next business day; Continental U.S. only.

For more information or to order, call us on our toll-free hotline:

1-800-858-4580

(in Texas call 1-806-745-8834)

or write us at:

P. O. Box 64240,
Lubbock, TX 79464

UNISOURCE ELECTRONICS, INC.

ARRO-SOFT SYSTEMS

Quality Soft Ware for the TI99/4A Computer

TEACHERS RECORD

Store and process name/grade data rapidly without using expensive external storage. Provides alphabetical listing, class and individual averages, letter grade assignment and individual record call up. Requires only cassette recorder, cable. Printer/RS232 optional. **$24.95**

INVESTMENT/FINANCE

Make individual retirement account (IRA) projections including investment of tax sheltered gains. Complex annuity calculations by refering to common examples. Calculate regular loan payments and print amortization schedule. In TI basic. Requires only cassette recorder, CRT. Printer optional. **$24.95**

ARRO-SOFT SYSTEMS
P.O. BOX 1761 EDMOND, OK 73083

Send for catalog of available programs.

FREE PROGRAM*

JACKPOT

THE EXCITEMENT OF LAS VEGAS & ATLANTIC CITY IS NOW YOURS AT HOME WITH THE ALL NEW VIDEO SLOT MACHINE GAME BY CAS. $14.95
(extended basic only)
***INTRODUCTORY OFFER-RECEIVE FREE 'THE AMORTIZER' WITH ANY ORDER FROM CAS. . . . . $8.95 VALUE**
WRITE FOR DETAILS ABOUT:
—ADDITIONAL GAMES
—HOME FINANCE PROGRAMS
—EDUCATIONAL PROGRAMS
(basic or extended basic)
all programs on cassette
SEND CHECK OR MONEY ORDER TO:
CASAS ADOBES SOFTWARE (CAS)
P.O. BOX 36295 TUCSON, AZ 85740

Success Formula . . . from p. 45

```
710 GOTO 1790
720 A$="  XXX"
730 PRINT "TO WIN YOU MUST GET AND
     KEEP:": :A$;M$: :A$;H$: :A$;F
    $
740 PRINT :"BY THE TIME YOU ARE":"
    40 YEARS OLD."
750 RETURN
760 CALL CLEAR
770 IF G>10 THEN 790
780 ON G GOTO 4620,4650,4710,4860,
    850,4900,830,4940,820,5090
790 ON G-10 GOTO 810,5170,860,5210
    ,5290,5360,800,5460,840,5530,1
    620
800 S=S+NE
810 S=S+NE
820 S=S+NE
830 S=S+NE
840 S=S+NE
850 S=S+NE
860 RETURN
870 CALL CLEAR
880 CALL SCREEN(11)
890 R=15
900 M$="OPPORTUNITY KNOCKS"
910 GOSUB 1320
920 PRINT "MAY GO TO:": :
930 FOR X=5 TO 19 STEP @
940 IF X=13 THEN 980
950 IF X>9 THEN 970
960 PRINT " ";
970 PRINT X;S$(X)
980 NEXT X
990 PRINT : :
1000 INPUT "ENTER NUMBER ":G
1010 FOR X=5 TO 19 STEP @
1020 IF G=X THEN 1050
1030 NEXT X
1040 GOTO 1000
1050 CALL SCREEN(15)
1060 S=0
1070 GOSUB 760
1080 IF S=0 THEN 1790
1090 GOTO 2140
1100 X=INT(3*RND)+NE
1110 IF E(X)=5 THEN 1140
1120 E(X)=E(X)+NE
1130 GOTO 1150
1140 X=0
1150 PRINT "EXPERIENCE=";X
1160 RETURN
1170 CALL CLEAR
1180 CALL SCREEN(12)
1190 PRINT "* TELEGRAM *"
1200 PRINT : : :"DRAFT NOTICE!": :,
     "UNCLE SAM": : :
1210 PRINT "2 YEARS IN ARMY.": :"CO
     LLEGE PAID.": : :
1220 L=L+@
1230 B(@)=NE
1240 GOSUB 1100
1250 CALL SCREEN(15)
1260 GOTO 1790
1270 FOR D=NE TO 300
1280 NEXT D
1290 RETURN
1300 M$=S$(G)
1310 R=12
1320 C=INT((32-LEN(M$))/@)
1330 FOR I=NE TO LEN(M$)
1340 D=ASC(SEG$(M$,I,NE))
1350 CALL HCHAR(R,C+I,D)
1360 NEXT I
1370 RETURN
1380 PRINT :"PRESS ANY KEY"
1390 GOSUB 5740
1400 RANDOMIZE
1410 O=INT(6*RND)+NE
1420 P=INT(6*RND)+NE
1430 DD=O+P
1440 ON D GOTO 1520,1480,1450
1450 Y=P
1460 C=7
1470 GOSUB 1570
1480 Y=O
1490 C=5
1500 GOSUB 1570
1510 PRINT
1520 IF (DD=7)+(DD=11)+(O=P)THEN 15
     50
1530 X=0
1540 RETURN
1550 X=NE
1560 RETURN
1570 FOR I=112 TO 117
1580 CALL HCHAR(24,C,I)
1590 NEXT I
1600 CALL HCHAR(24,C,111+Y)
1610 RETURN
1620 M=M+A
1630 R=10
1640 M$="DOUBLE"
1650 GOSUB 1320
1660 M$="PAYDAY"
1670 CALL SOUND(240,392,@)
1680 CALL SOUND(360,523,@)
1690 CALL SOUND(120,392,@)
1700 CALL SOUND(360,494,@)
1710 CALL SOUND(120,523,@)
1720 GOSUB 1310
1730 M=M+A
1740 L=L+NE
1750 B(NE)=0
1760 GOSUB 1270
1770 CALL CLEAR
1780 RETURN
1790 GOSUB 1270
1800 CALL CLEAR
1810 B(NE)=B(NE)+NE
1820 IF B(NE)<5 THEN 1840
1830 GOSUB 1660
```

W.O.R.D. Software
designed with User in mind
TI-Basic cassette programs for the 99/4A

W.O.R.D. Writer ($20)—access to printer & cassette OR disk are ALL you need for complete word processing. **FEATURES:**

- word wrap (auto format to any line length)
- fast cassette text storage (packed format) or Disk
- controls any printer (**bold**, type styles, # copies, lines spacing, margins)
- tab, center, or right justify line(s)
- search/replace, copy, merge text
- includes 28 page manual & keyboard overlay

X-basic version ($30)—easier, faster, more features (right justify), more text space

W.O.R.D. MAILER ($20)—or general filer

- Mailing labels & lists by alphabet or zip code
- you pick # items/name & prompts
- selection codes for groups & subgroups
- uses WORD Writer text for form letters
- unlimited capacity with multi-tape or disk

Wizard Quizzer ($10)—Parents and teachers!

- Enter and save your own questions & answers.
- Opt. —>With speech synthesizer & TEII, it TALKS!

5 of a KIND ($10)—like the famous dice game, 1-4 players, good graphics & "score card"

ALL 4 programs for $55!
*** shipping & tax INCLUDED!**
25% commission paid for referrals

ORDERS—INFO: W.O.R.D.2706 Inridge Dr.
Austin, TX 78745 (512) 443-4274

TI gave us . . . **"FREE SPEECH"**, DANLEN gives you **FREE CHOICE:**

- •**FREE** Disk Catalog Program.
- •**FREE** Cassette Catalog Program.
- •**FREE** Both Programs.

These programs will show the contents of your diskettes and cassettes.

Please send $6 (DSK-CAT) or $4 (CAS-CAT) or $10 (BOTH) to pay the cost of media, postage and handling. Thank You.

DANLEN offers you one stop shopping convenience, with a fantastic selection of Hardware, Software, Supplies, Peripherals, Cables, Adapters, Furniture, Accessories, and Technical Information for your TI HOME COMPUTER. Write or call today (305) 621-4910. **Free catalog upon request.**

DANLEN ENTERPRISES
DEPT. HC308
P. O. Box 523036
Miami, FL 33152

Success Formula

```
1840 PRINT TAB(8);"CAREER RESUME":T
     AB(21);"AGE:";L;"SALARY: $";A:
     "EDUCATION: ";E$(N)
1850 PRINT :"     CASH-ON-HAND:$";M:
     TAB(8);"HAPPINESS: ";H:TAB(13)
     ;"FAME: ";F
1860 PRINT "EXPERIENCE:"
1870 FOR I=5 TO 19 STEP @
1880 IF B(I)=0 THEN 1900
1890 PRINT B(I);S$(I)
1900 NEXT I
1910 PRINT :"YOUR OBJECTIVES:":"   $
     ";Q:"   ";H$:"   ";F$
1920 IF B(NE)=9 THEN 5880
1930 IF (M<Q)+(H<HP)+(F<FP)THEN 207
     0
1940 GOSUB 1270
1950 CALL CLEAR
1960 M$="A WINNER!"
1970 GOSUB 1310
1980 FOR C=10 TO 22
1990 CALL SOUND(-99,1047,@)
2000 CALL HCHAR(11,C,36)
2010 CALL HCHAR(13,C,100)
2020 CALL SOUND(-99,2885,5)
2030 CALL HCHAR(14,C,105)
2040 NEXT C
2050 B(NE)=9
2060 GOTO 1840
2070 IF L>40 THEN 5630
2080 IF M<-20000 THEN 5600
2090 D=NE
2100 GOSUB 1380
2110 IF (B(@)=NE)+(L>30)THEN 2130
2120 IF (DD=@)+(DD=12)THEN 1170
2130 IF (DD=7)+(DD=11)THEN 870
2140 IF S=0 THEN 2160
2150 PRINT :"ENTER":"    ";S$(G):"OR
     "
2160 PRINT :"YOU HAVE THESE OPTIONS
     :"
2170 FOR X=NE TO 3
2180 IF E(X)=0 THEN 2230
2190 Y=0
2200 IF G+X<=21 THEN 2220
2210 Y=21
2220 PRINT "    ";S$(G+X-Y)
2230 NEXT X
2240 PRINT "    CHANCE": :
2250 INPUT "ENTER CHOICE ":M$
2260 IF S=0 THEN 2280
2270 IF M$=S$(G)THEN 2420
2280 IF M$="CHANCE" THEN 2500
2290 FOR X=NE TO 3
2300 Y=0
2310 IF G+X<=21 THEN 2330
2320 Y=21
2330 IF M$=S$(G+X-Y)THEN 2360
2340 NEXT X
2350 GOTO 2250
2360 IF E(X)=0 THEN 2250
2370 E(X)=E(X)-NE
2380 IF G+X>21 THEN 2410
2390 G=G+X
2400 GOTO 2420
2410 G=G+X-21
2420 S=0
2430 GOSUB 760
2440 IF S=0 THEN 2570
2450 IF B(G)=3 THEN 2620
2460 K=NE
2470 M$="ENTER "&S$(G)
2480 GOSUB 1310
2490 ON S GOTO 2650,2950,3010,3070,
     3120,3190
2500 D=NE
2510 GOSUB 1400
2520 IF G+DD<=21 THEN 2540
2530 G=G-21
2540 G=G+DD
2550 S=0
2560 GOSUB 760
2570 IF G<21 THEN 1790
2580 G=0
2590 GOTO 1790
2600 GOSUB 4560
2610 PRINT :"NOT ENOUGH CASH-ON-HAN
     D."
2620 PRINT :"YOU CAN'T ENTER."
2630 S=0
2640 GOTO 1790
2650 IF N>3 THEN 2620
2660 IF B(@)=0 THEN 2690
2670 PRINT "VETERAN--TUITION PAID"
2680 GOTO 2720
2690 PRINT "TUITION= $ 5000"
2700 IF M<5000 THEN 2610
2710 M=M-5000
2720 IF N>NE THEN 2880
2730 PRINT : :NE;
2740 PRINT E$(@);" IN:": :"    HUMA
     NITIES":"    SOCIAL SCIENCES":
     : :
2750 IF N>NE THEN 2850
2760 PRINT @;
2770 PRINT E$(3);" IN:": :"    SCIE
     NCE":"    ENGINEERING": : : :
2780 IF N>NE THEN 2850
2790 INPUT "ENTER  1 OR 2 ":X
2800 IF (X<>NE)*(X<>@)THEN 2790
2810 N=X+NE
2820 CALL CLEAR
2830 IF N=@ THEN 2740
2840 IF N=3 THEN 2770
2850 PRINT :"4 YEARS--NO SALARY"
2860 L=L+4
2870 GOTO 2920
2880 N=N+@
2890 PRINT :"2 YEARS--RECEIVE SALAR
     Y"
```

Continued on p. 48

HARVEY'S SPECIAL
OF THE MONTH
PROGRAMMING WITH FILES

PROGRAMMING TIPS OF THE MONTH:
1. Write file processing programs on the premise the file exists. 2. Write another program whose only objective is to provide the file for the first run of the other program. The file created will contain one record, the end of file record. The above tips apply to sequential file processing on a cassette system.

GUIDE TO FILE PROCESSING ON A TI99/4A CASSETTE SYSTEM: Reg. $25. A programming guide written specifically for cassette system owners who want to learn how to write programs that use data stored on cassette tape. You should have some previous experiences writing Basic. The text covers: Program development planning suggestions; program organizations; sequential file processing; end of file checking; the concept of 1 and 2 dimensional array processing; and with numerous programing code examples. Text is 8 x 11 inch pages, from a Daisy Wheel printer, and bound in a Duo-Tang cover. For $25. you get the text and free delivery in the US.

HOW TO CREATE AND MAINTAIN RELATIVE FILES: Regular low price: $50. For /4A disk system owners wanting to learn how to write programs using relative files. You should be experienced enough to follow the programming examples given in the text. The disk which accompanies the text has 7 programs, which are there mostly to illustrate standard file updating routines in a home application. Also included is a sort utility program designed for use with relative files. The text is 65, 8 x 11 inch pages (Daisy Wheel Printer) of "How To" instructions, program listings, plus a form. The file creation and maintenance functions are covered well enough you should be able to start right off using relative files. The text now includes 1983 revisions. For $50. you get the text, the programs disk and free delivery in the U. S.

Send me a check or Postal Money Order, and I will ship right away by First Class Mail. No sales outside the U.S. Dealers and Whslc. Distributors: Try me. Free catalog contains a list of useful programs written by:

James Harvey
159 Dover Rd.
Spartanburg, S. C. 29301
1-803-576-7245

Delivery and satisfaction is guaranteed. Buy with complete confidence.

Machine Shoppe Software

Cassette-Catalogue™

Are you tired of too many cassettes? Do you have programs you can't find on inadequately marked cassette tapes? Consolidate your program collection! This indexing program will enable you to quickly and efficiently locate and load any program at any point along a C-60 cassette tape with or without a tape counter on your recorder. Up to a maximum of 20 programs per cassette. If you do not now own a disk memory system and you do not anticipate owning one in the foreseeable future, then this program is for you. Please specify console or extended basic. SPECIAL INTRODUCTORY PRICE. $7.95*

Inovative ideas for the use of your microcomputer. Watch for our ads in upcoming issues. Under development, a complete line of cassette based software for your TI-99/4A.

Price includes Postage & Handling.
Send check or money order to:

Machine Shoppe Software
P. O. Box 1153 - Ozark, AL 36360
205-774-9162
(AL residents add 7% sales tax)
*Price expires 30 Nov. 1983.

E-Z-DO-XBASE

Program Extended Basic with a fully prompted easy-to-use set of statements. No punctuation syntax required. Semi-compiled listing. Full use of all colors. Eight user designed Sprites and many more features. Program graphics, slow pace games and animations in your first hour of use. It's just great! **29.95 Value-. . Only 19.95**

ASTEROID DEFENDER IN QUEST OF GOLD

Fantastic flight control of your drone in 3-D graphics with shadow effect. See how many GOLD bars you can bring home. With neat TI Voice and a gift program. 14.95

SHOOTING GALLERY

An old classic in an electronic version with TI Voice and gift program. 14.95

POOR MAN'S PLOTTER

Line drawing and plotting with easy use of 48 predefined patterns. Requires 16K console and X-Basic only. . . . . Only 14.95

COLOR BAR — DOT GENERATOR

(TI or X-Basic)
Makes your computer a $125 piece of test gear.
12.95. . . . . . . ONLY 8.00 WITH ANY ABOVE PROGRAM

COMPUTERTRONICS
P.O. BOX 15823, Plantation, FL 33318

Send money order, cashiers check or check
Florida Residents add 5% Sales Tax
Cassette Only - Extended Basic - Games Require Joysticks
Games play with or without Speech Synthesizer

DEJ SOFTWARE
ANNOUNCES ITS LATEST PROGRAMS —

ASW TACTICS

DESIGNED BY A NAVY HELICOPTER PILOT; THIS GAME NEARLY DUPLICATES THE ACTUAL ANTI-SUBMARINE WARFARE TACTICS TRAINER USED IN THE FLEET. A TRUE CHALLENGE AT $ 14.95

ASTRO MOUSE

SCORE 9 LASER HITS ON THE LASER CAT BEFORE HE HITS YOU. BUT DON'T WASTE TIME—THERE'S A TIME LIMIT. A REAL SWEAT PRODUCER AT $12.95

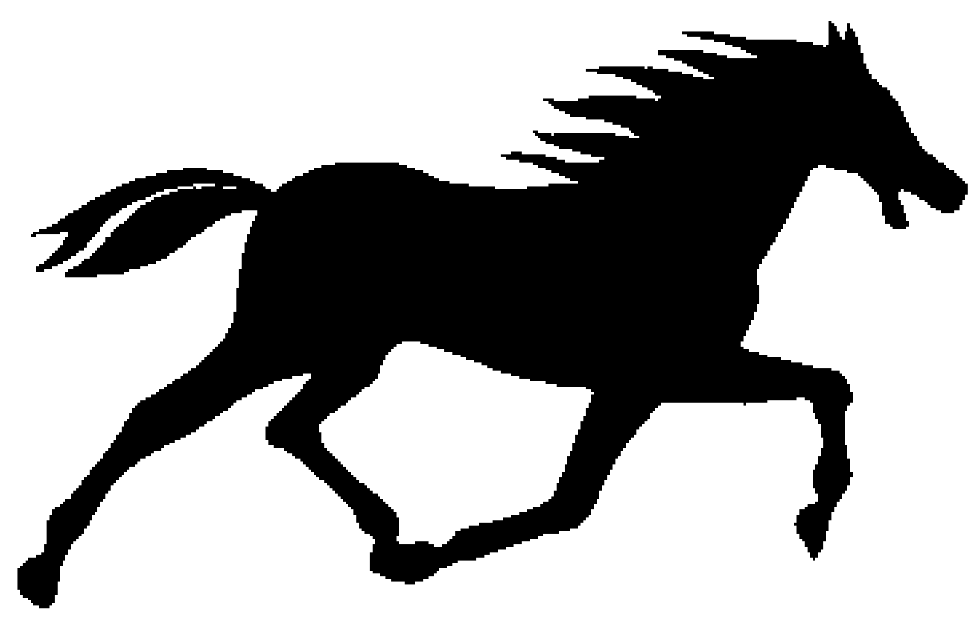
ATTENTION PROGRAMMERS:
SEND US A COPY OF YOUR GAME TAPE AND WE WILL DISTRIBUTE IT FOR YOU.

DEJ SOFTWARE
575 WISTERIA STREET
CHULA VISTA, CA. 92011

INCLUDE 50¢ POSTAGE WITH ALL ORDERS
CALIFORNIA RESIDENTS ADD 6%

IT'S NO GAME!!

Not another computer game but an actual speed handicapping aid for thoroughbred racing, handling up to sixteen horses per race from 4½ furlongs to 2 miles.



IT'S FAST!

Just six bits of information from *The Daily Racing Form*© and your TI-99/4 (4A) returns speed of each horse in ft./sec. at each quarter, plus predicted finish time! Manages horse numbers, OTB letters and scratches; adjusts routers and sprinters.

User friendly and error proof.

Package contains cassette and step-by-step instruction booklet. Data displays on screen and/or TI thermal printer (recommended) or compatable RS232.

ONLY $34.95!

NY residents add $2.88. Canadian residents: $42.95
Send check or money order to:

TRACKSMITH
P.O. Box 738, Cooper Station, NY 10276

Success Formula . . . from p. 47

```
2900 L=L+@
2910 M=M+A+A
2920 RESTORE 32767
2930 GOSUB 5770
2940 GOTO 3340
2950 X=30000
2960 RESTORE 5830
2970 GOSUB 5770
2980 IF N=3 THEN 3340
2990 IF N=5 THEN 3330
3000 GOTO 3280
3010 X=5000
3020 RESTORE 5840
3030 GOSUB 5770
3040 IF N=NE THEN 3060
3050 K=@
3060 GOTO 3290
3070 X=1000
3080 RESTORE 5850
3090 GOSUB 5770
3100 IF N>NE THEN 3330
3110 GOTO 3280
3120 X=30000
3130 RESTORE 5860
3140 GOSUB 5770
3150 IF N=4 THEN 3330
3160 GOTO 3280
3170 K=B(13)+NE
3180 GOTO 3290
3190 IF L<36 THEN 3220
3200 PRINT :"YOU'RE OVER 35."
3210 GOTO 2620
3220 X=40000
3230 RESTORE 5870
3240 GOSUB 5770
3250 IF B(17)<@ THEN 3270
3260 K=3
3270 IF N>NE THEN 3340
3280 IF B(G)>0 THEN 3340
3290 PRINT "PAY $";X
3300 IF M<X THEN 2600
3310 M=M-X
3320 GOTO 3340
3330 K=@
3340 J=0
3350 PRINT :"POINTS AND MONEY X";K
3360 GOSUB 1270
3370 CALL CLEAR
3380 PRINT "EXPERIENCE OPTIONS:": :
3390 FOR X=NE TO 3
3400 IF (E(X)=0)+(J+X>10)THEN 3460
3410 M$=B$(S,J+X)
3420 IF LEN(M$)<26 THEN 3450
3430 PRINT X;SEG$(M$,NE,25):SEG$(M$
,26,28)
3440 GOTO 3460
3450 PRINT X;M$
3460 NEXT X
3470 PRINT :"OR": :"4 TAKE A CHANCE
": : :
3480 M$=""
3490 INPUT "ENTER NUMBER ":X
3500 X=INT(X)
3510 IF (X<NE)+(X>4)THEN 3490
3520 IF X=4 THEN 3570
3530 IF (E(X)=0)+(SB+X>10)THEN 349
3540 E(X)=E(X)-NE
3550 J=J+X
3560 GOTO 3600
3570 D=NE
3580 GOSUB 1400
3590 J=J+D
3600 CALL CLEAR
3610 IF J>10 THEN 4460
3620 PRINT B$(S,J): : : : : : :
 : : : :
3630 ON J GOTO 3830,3830,3830,421
3870,3870,3910,3910,4270,445
3640 IF U=0 THEN 3680
3650 CALL HCHAR(14,3,100,U)
3660 H=H+U
3670 U=0
3680 IF V=0 THEN 3720
3690 CALL HCHAR(19,3,105,V)
3700 F=F+V
3710 V=0
3720 IF W=0 THEN 3760
3730 PRINT "$";W
3740 M=M+W
3750 W=0
3760 PRINT M$: :
3770 IF T=0 THEN 3360
3780 FOR Y=NE TO T
3790 GOSUB 1100
3800 NEXT Y
3810 T=0
3820 GOTO 3360
3830 T=K*INT(3*RND)
3840 U=U+(K*INT(9*RND))
3850 V=V+(K*INT(9*RND))
3860 GOTO 3640
3870 U=K*INT(11*RND)*B(4)
3880 V=K*INT(11*RND)*B(10)
3890 W=K*1000*B(16)
3900 GOTO 3840
3910 U=K*B(6)
3920 V=K*B(12)
3930 W=K*1000*B(18)
3940 IF J=7 THEN 3970
3950 IF B(23)>0 THEN 4150
3960 GOTO 3840
3970 IF B(22)>0 THEN 3990
3980 GOTO 3840
3990 ON B(22)GOTO 4000,4050,4080,4
20
4000 F=INT(F/@)
4010 U=0
4020 V=0
4030 M$="LOSE HALF YOUR FAME"
4040 GOTO 3640
4050 H=0
4060 M$="LOSE ALL HAPPINESS"
4070 GOTO 3640
```

SMART PROGRAMMING GUIDE™ FOR SPRITES 5.95

This guide will show you some of our professional programming secrets on how to: Use CALL PEEK • Get Sprites to pick up objects, eat dots and lay down a trail. • Shoot sprites without missing a coincidence. • Make one sprite chase another. • Easily convert sprite rows and columns into graphic rows and columns and visa versa. • Generate moving sprite patterns. • Use 3 different CALL KEY or CALL JOYST examples for moving sprites. • Write a GENERAL BAR GRAPHING program (to one pixel accuracy) that shows you sprites aren't just for games.

Full of fast running and Byte saving examples that you can use in your existing programs or combine together to write your own programs. Each example program is fully documented in a step by step method that is easy to understand. A TI 99/4 or 99/4A computer and the extended basic command module are required.

Sorry, no C.O.D.'s or credit card orders. Foreign orders payable in U.S. currency. CA. residents add 6½% sales tax. Shipping and handling U.S., Canada and Mexico 1.50. All other countries 3.50.

15 day money back guarantee.

MILLERS GRAPHICS
1475 W. CYPRESS SAN DIMAS, CA 91773
(714) 599-1431

Success Formula

```
4080 M=0
4090 U=0
4100 M$="LOSE ALL CASH"
4110 GOTO 3640
4120 A=A+(5000*K)
4130 M$="INCREASE SALARY $"&STR$(50
00*K)
4140 GOTO 3640
4150 A=INT(A/@)
4160 U=0
4170 V=0
4180 W=0
4190 M$="SALARY REDUCED"
4200 GOTO 3640
4210 D=@
4220 GOSUB 1380
4230 U=K*O*B(8)
4240 V=K*O*B(14)
4250 W=K*O*1000*B(20)
4260 GOTO 3640
4270 IF S<>NE THEN 4290
4280 IF (B(17)=3)+(L>35)THEN 4460
4290 IF K<3 THEN 4310
4300 B(17)=3
4310 GOSUB 4560
4320 G=B(24)
4330 IF G=17 THEN 4360
4340 GOSUB 760
4350 GOTO 1790
4360 B(25)=15
4370 GOSUB 4410
4380 S=6
4390 CALL CLEAR
4400 GOTO 2470
4410 A=A+(B(25)*1000*K)
4420 PRINT "NEW SALARY= $";A: :
4430 GOSUB 1270
4440 RETURN
4450 GOSUB 4410
4460 PRINT :"EXIT ";S$(G): :
4470 IF S>NE THEN 4500
4480 GOSUB 4410
4490 GOTO 4540
4500 B(G)=B(G)+NE
4510 FOR Y=NE TO B(G)
4520 GOSUB 1100
4530 NEXT Y
4540 GOSUB 4560
4550 GOTO 1790
4560 FOR X=4 TO 22 STEP @
4570 B(X)=0
4580 NEXT X
4590 B(23)=0
4600 S=0
4610 RETURN
4620 GOSUB 1300
4630 Z=INT(A*(A/30000))
4640 GOTO 5050
4650 M$="BUY A "&S$(G)
4660 GOSUB 1310
4670 X=INT(A/1000)
4680 Y=0
4690 Z=A
4700 GOTO 4990
4710 GOSUB 1300
4720 PRINT "YOU ARE SUED FOR LIBEL"
: :
4730 D=NE
4740 GOSUB 1380
4750 IF X=NE THEN 4830
4760 PRINT : :"GUILTY!"
4770 IF MK=0 THEN 4800
4780 Z=INT(M/@)
4790 GOSUB 5050
4800 PRINT :"LOSE 1/2 YOUR FAME": :
 :
4810 F=INT(F/@)
4820 GOTO 4840
4830 PRINT : :"NOT GUILTY--": : :
4840 GOSUB 1100
4850 RETURN
4860 GOSUB 1300
4870 L=L+NE
4880 PRINT "LOSE 1 YEAR'S TIME & SA
LARY"
4890 RETURN
4900 GOSUB 1300
4910 PRINT "LOSE 25% OF YOUR CASH"
4920 M=M-INT(M/4)
4930 RETURN
4940 M$="INVEST IN A HOBBY"
4950 GOSUB 1310
4960 X=INT((A/1000)*RND)
4970 Y=X
4980 Z=A-(X*1000)
4990 IF X=0 THEN 5020
5000 H=H+X
5010 CALL HCHAR(16,3,100,X)
5020 IF Y=0 THEN 5050
5030 F=F+Y
5040 CALL HCHAR(18,3,105,Y)
5050 M=M-Z
5060 PRINT :"PAY $";Z
5070 GOSUB 1270
5080 RETURN
5090 GOSUB 1300
5100 IF M>0 THEN 5130
5110 Z=0
5120 GOTO 5050
5130 D=3
5140 GOSUB 1380
5150 Z=X*INT(M/@)
5160 GOTO 5050
5170 M$="RENT IS DUE"
5180 GOSUB 1310
5190 Z=INT(A/@)
5200 GOTO 5050
5210 GOSUB 1300
5220 IF M>0 THEN 5250
5230 PRINT "FORGET IT!"
5240 RETURN
5250 D=@
5260 GOSUB 1380
5270 Z=INT(.1*M*O)
5280 GOTO 5050
5290 M$=S$(G)&"AN HOLIDAY"
5300 GOSUB 1310
5310 X=INT(30*RND)+10
5320 Y=0
5330 Z=0
```

Continued on p. 50

PRINTING

FOR YOUR TI-99/4A

- PROGRAM LISTINGS
- WORD PROCESSING
- GRAPHICS

SATISFACTION
GUARANTEED
QUICK SERVICE

INTRODUCTORY PRICE PER
DISK, CASSETTE OR 16K

$5.00

MICROS' INK
P.O. BOX 3725
ALLIANCE, OH 44601

99/4 ACCESSORIES
SINGLE STEP ADAPTER

WORKS WITH EDITOR-ASSEMBLER DEBUG. HAS LOAD INTERRUPT TO RETURN TO DEBUG 44.95
WITH 2K RAM (EXPANDABLE TO 8K) 54.95

DOUBLE DENSITY UPGRADE KIT

FOR PHP1800 DISK CONTROLLER. OPERATES SINGLE OR DOUBLE DENSITY. UP TO FOUR SINGLE OR DOUBLE SIDED DRIVES $249.95

PROTOTYPE BOARD

FOR EXPANSION CHASSIS. HOLDS 60 16 PIN DIPS & REGULATOR. WITH OUTPUT CONNECTOR. .39.95

EXTENDER BOARD

FITS EXPANSION CHASSIS FOR EASY TROUBLE SHOOTING & SERVICE....................29.95

ADD $3.00 SHIPPING & HANDLING

SPECIALTY SERVICES
511 Martha, Euless, TX 76039
817-267-8338 TELEPHONE
ANSWERED M-F 6-10PM. OR
LEAVE MESSAGE

M.C. VISA
PERSONAL CHECKS
ALLOW 3 WEEKS
TO CLEAR
TX RESIDENTS
ADD 5 SALES TAX

WRITE OR CALL FOR ADDITIONAL INFORMATION ON OUR OTHER FINE PRODUCTS. DEALER AND INDUSTRIAL INQUIRIES WELCOME.

ADVENTURE GAMES from
SHENANGO ENTERPRISES
19401 Shenango Drive
Tarzana, CA 91356

1. **AGENT 000:** Outwit the enemy agents, escape a black hole, search Atlantis, much more.
2. **AGENT 000 RETURNS:** Unravel a time paradox, unite the ghost and Agent 000, more.

One game	Two games
$16.95	**$24.95**

Check or money order.

Versions:
A. Xbasic, Cassette
B. Xbasic, Disk
C. Xbasic, Disk, 32K

SA2
SOFTWARE

FINANCIAL PROGRAMS FOR THE TI99/4A

WANT MORE THAN GAMES ON YOUR COMPUTER? TRY THESE PRACTICAL,LOW-COST PROGRAMS. BOTH USE SCREEN-MENU FORMAT,ALLOW USER ACCESS,AND HAVE DETAILED INSTRUCTIONS.

*** MONTHLY BUDGET$ MASTER ***
CREATE UP TO 30 BUDGET ACCOUNTS OR USE BUILT-IN FORMAT. RAPID DATA ENTRY AND EDITING. SAVE AND RETRIEVE DATA FILES. OUTPUT RESULTS TO SCREEN OR A PRINTER.

*** INCOME TAX PLANNER ***
DONT BE CAUGHT BY SURPRISE NEXT APRIL! FORECAST NEXT YEARS TAX BILL AND AVOID OVER OR UNDER WITHHOLDING. DATA CAN BE REVISED & RESAVED AS ESTIMATES CHANGE.

SPECIFY TI OR X-BASIC;CASSETTE OR DISK
$12 EACH OR $18 FOR BOTH (DISK ADD $2)

SEND CHECK OR MONEY ORDER TO:

SA2 SOFTWARE
P.O.BOX 2465
NAPERVILLE IL 60565

KALEIDOSCOPE PROGRAMS

P.O. Box 8453
Universal City, CA 91608

VIDEO TAPE FINDER

MANAGES YOUR COLLECTION. STOP LABELING TAPES! FINDS TITLES. SORTS ACCORDING TO ALPHA, THEATER, RATINGS, TAPE #'S .... CASSETTE $35.00

FOREIGN LANGUAGE VOCABULARY

DRILL MAKES LEARNING FUN. LESSON BY LESSON DRILL, SCORING, REWARDS......... CASSETTE $25.00

MENU PLANNER

FIND YOUR FAVORITE RECIPE BY FOOD CATAGORY. CHICKEN, BEEF, ETC. IS ON SALE? FIND OUT FAST WHERE THAT SPECIAL RECIPE IS LOCATED. ....CASSETTE $15.00

ALL YOU NEED:
16K TI BASIC
(PRINTER-32K-SPEECH OPTIONAL)

ADD $2.00 HANDLING CHARGE
CA RESIDENTS ADD SALES TAX

Success Formula . . . from p. 49

```
5340 PRINT "TRIP TO THE ISLANDS!":
     : :
5350 GOTO 5000
5360 GOSUB 1300
5370 IF M<A THEN 5440
5380 D=3
5390 GOSUB 1380
5400 Z=(X*5*A)-A
5410 M=M+Z
5420 PRINT "$";Z
5430 IF Z>0 THEN 5450
5440 PRINT :"SORRY"
5450 RETURN
5460 GOSUB 1300
5470 IF M<20000 THEN 5440
5480 X=24
5490 Y=4
5500 Z=20000
5510 PRINT "WEEKEND TO REMEMBER!"
5520 GOTO 5000
5530 GOSUB 1300
5540 IF M>0 THEN 5560
5550 PRINT "THANKS, ANYWAY."
5560 Z=INT(.1*M)
5570 Y=4
5580 X=INT(Z/1000)+4
5590 GOTO 4990
5600 CALL CLEAR
5610 PRINT "DECLARE BANKRUPTSY"
5620 GOTO 5650
5630 CALL CLEAR
5640 PRINT "YOU ARE";L;"AND HAVEN'T
     ":"REACHED YOUR OBJECTIVES."
5650 GOSUB 1270
5660 CALL CLEAR
5670 M$="YOU LOSE"
5680 GOSUB 1310
5690 X=14080
5700 CALL SOUND(-99,X,0)
5710 X=X/0
5720 IF X=55 THEN 2050
5730 GOTO 5700
5740 CALL KEY(0,R,ST)
5750 IF ST=0 THEN 5740
5760 RETURN
5770 READ B1
5780 FOR B2=NE TO B1
5790 READ B3,B4
5800 B(B3)=B4
5810 NEXT B2
5820 RETURN
5830 DATA 7,4,1,6,12,8,6,10,1,12,12
     ,24,17,25,5
5840 DATA 7,4,1,16,5,20,3,22,4,23,1
     ,24,10,25,3
5850 DATA 7,4,1,6,8,8,1,14,1,20,1,2
     4,4,25,2
5860 DATA 7,6,5,12,10,14,4,16,10,22
     ,1,24,10,25,5
5870 DATA 7,4,1,12,10,16,5,18,-5,2
     ,10,24,4,25,7
5880 END
```

Success Formula Supplemental Data Program
Explanation of the Program

Line Nos.	
100-190	Program header.
200-330	Dimension arrays, read DATA into arrays from DATA statements.
340-400	Output DATA to the cassette tape.
410-570	Supplemental DATA for the main program *Success Formula*.

```
100 REM ******************
110 REM *SUCCESS FORMULA*
120 REM *                *
130 REM * SUPPLEMENTAL   *
140 REM * DATA PROGRAM   *
150 REM ******************
160 REM BY BUD DAVIS
170 REM 99'ER VERSION 2.10.1
180 REM
190 REM
200 CALL CLEAR
210 PRINT "RECORD DATA ON TAPE FO
        INPUT TO SUCCESS FORMULA
      PROGRAM.": : : :
220 DIM B$(6,10),E$(5),S$(21)
230 FOR S=1 TO 6
240 FOR SB=1 TO 10
250 READ B$(S,SB)
260 NEXT SB
270 NEXT S
280 FOR EP=1 TO 5
290 READ E$(EP)
300 NEXT EP
310 FOR SQ=1 TO 21
320 READ S$(SQ)
330 NEXT SQ
340 OPEN #1:"CS1",INTERNAL,OUTPU
    FIXED 192
350 FOR S=1 TO 6
360 PRINT #1:B$(S,1),B$(S,2),B$(
    3),B$(S,4),B$(S,5),B$(S,6),B
    S,7),B$(S,8),B$(S,9),B$(S,10)
370 NEXT S
380 PRINT #1:E$(1),E$(2),E$(3),E
    4),E$(5),S$(1),S$(2),S$(3),S
    4),S$(5),S$(6),S$(7),S$(8),S
    9),S$(10)
```

Continued on p.

THE 128K MEMORY CARD

We've been shipping our 32K Memory Card in volume, and customers across the country have been calling to praise our product. If you write programs and need more memory **or** if you want to take advantage of large memory programs our **128K Memory Card** may be right for you.

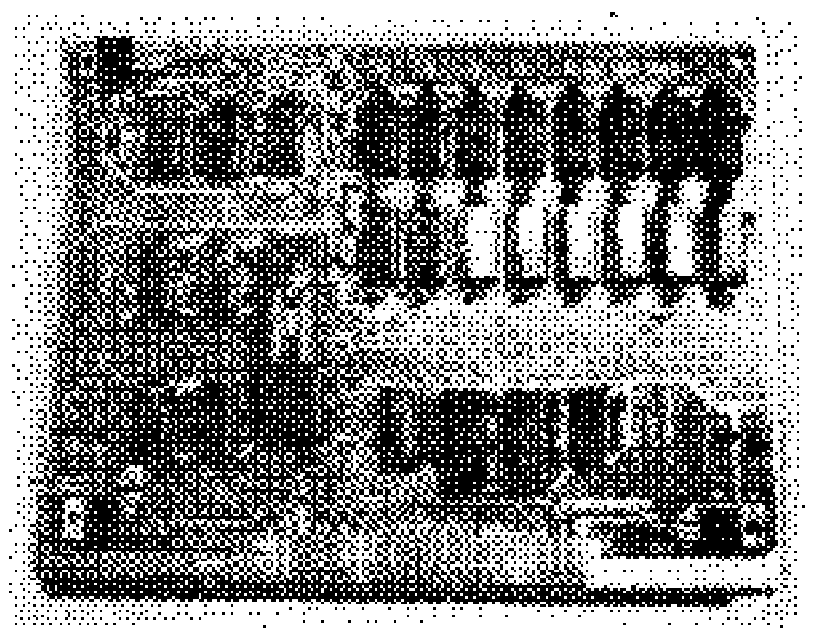
Both cards begin with a quality design by our MIT-trained engineering team and feature:
- The finest components
- Prime integrated circuits from top manufacturers
- A durable metal case that plugs into your Peripheral Expansion Box

Both the 32K and 128K Memory Card run the same programs as the TI card, including Logo, Pascal, Extended Basic, and Assembler.

Please note that a letter or a phone call will reserve a card for you even if you can't take immediate delivery.

3 month warranty
Prepaid/C.O.D. Add 3% shipping
Calif. residents add 6% sales tax
2-4 weeks for delivery

So now you have a choice* –
- The 32K Memory Card at $150
- The 128K Memory Card at $220



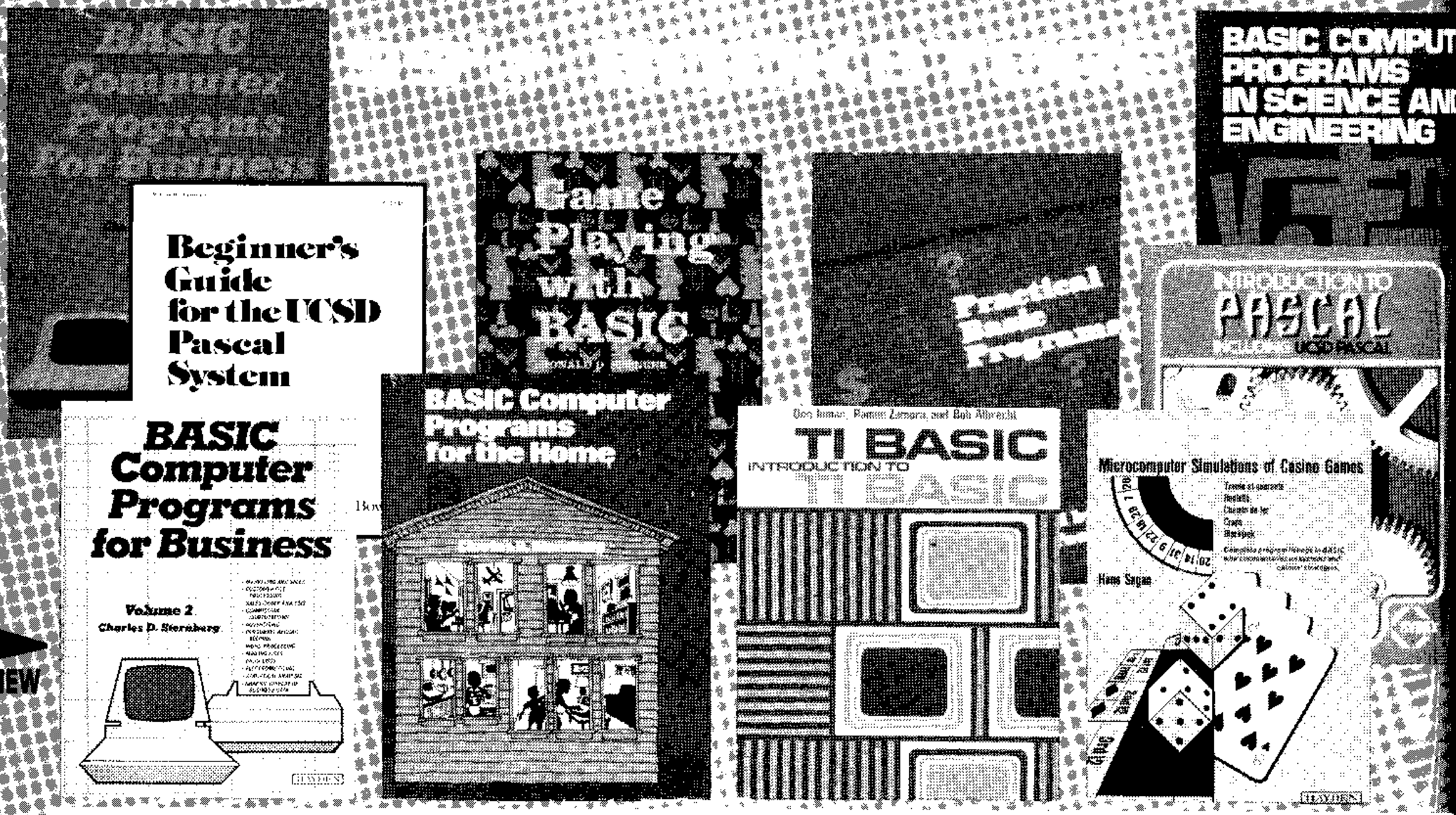
*Introductory Price – Order Now!

FOUNDATION
74 Claire Way, Tiburon, CA 94920
(415) 388-3840

Cashflow . . . from p. 26

```
460 GOSUB 1580 :: GOSUB 1600 :: GO
    TO 380
470 CALL CLEAR :: C=16-LEN(I$(I))/
    2
480 DISPLAY AT(1,C):I$(I):TAB(C-1)
    ;RPT$("_",LEN(I$(I))+2):"MONTH
    ":"________":"$ DUE:":"______"
490 B=8 :: FOR PT=1 TO 4
500 IF MO(I,PT)<>0 THEN DISPLAY AT
    (3,B):STR$(MO(I,PT)):: DISPLAY
     AT(5,B):STR$(X(I,PT))ELSE DIS
    PLAY AT(3,B):"-" :: DISPLAY AT
    (5,B):"-"
510 B=B+5 :: NEXT PT
520 DISPLAY AT(8,10):"AMOUNT SAVED
    ":TAB(9);"____________"
530 FOR M=1 TO 12 :: DISPLAY AT(M+
    9,9):M$(M);TAB(19);"$";STR$(RD
    (AK(I,M))):: NEXT M
540 DISPLAY AT(23,1)BEEP:"**PRESS:
     1. TO ALTER":TAB(10);"2. TO C
    ONTINUE"
550 CALL KEY(0,K,S):: IF S=0 OR K<
    49 OR K>50 THEN 550
560 IF K=50 THEN GOSUB 1580 :: GOS
    UB 1600 :: GOTO 380
570 IF I$(I)="" THEN C=C-1
580 ACCEPT AT(1,C)SIZE(-14)VALIDAT
    E(UALPHA,"'-")BEEP:I$(I)
590 B=8 :: FOR PT=1 TO 4 :: ACCEPT
     AT(3,B)SIZE(-2)VALIDATE(DIGIT
    ,"-")BEEP:MO$(I,PT)
600 IF MO$(I,PT)="-" THEN MO(I,PT)
    =0 ELSE MO(I,PT)=VAL(MO$(I,PT)
    )
610 IF MO(I,PT)<0 OR MO(I,PT)>12 T
    HEN 590 ELSE IF MO$(I,PT)="-"
    THEN 640
620 ACCEPT AT(5,B)SIZE(-4)VALIDATE
    (DIGIT,"-")BEEP:X$(I,PT):: IF
    X$(I,PT)="-" THEN X(I,PT)=0 EL
    SE X(I,PT)=VAL(X$(I,PT))
630 IF VAL(X$(I,PT))<0 THEN 620 EL
    SE B=B+5 :: NEXT PT
640 FOR M=1 TO 12 :: ACCEPT AT(M+9
    ,20)SIZE(-5)VALIDATE(DIGIT)BEE
    P:AK(I,M):: NEXT M
650 GOTO 540
660 !       ENTER NEW ITEMS
670 GOSUB 980 :: GOSUB 1580 :: GOS
    UB 1600 :: GOTO 380
680 !       DELETE ITEMS
690 DISPLAY AT(21,1):"ENTER THE NU
    MBER OF THE ITEM":"YOU WANT TO
     DELETE. IF YOUR":"DELETIONS A
    RE COMPLETE,":"PRESS '0': 0"
700 ACCEPT AT(24,12)SIZE(-2)VALIDA
    TE(DIGIT)BEEP:I :: IF I=0 THEN
     720 ELSE IF I<1 OR I>A THEN 6
    90 ELSE I$(I)=""
710 FOR M=1 TO 12 :: AK(I,M)=0 ::
    NEXT M :: FOR PT=1 TO 4 :: MO(
    I,PT),X(I,PT)=0 :: NEXT PT
720 GOSUB 1580 :: GOSUB 1600 :: GO
    TO 380
730 !     CHANGES COMPLETED
740 GOSUB 1570 :: GOSUB 1220 :: GO
    TO 300
750 ! DISPLAY ACCOUNTS
760 DATA TOTAL," -SAVINGS"," -EXPE
    NSES",PAY SAVINGS
770 RESTORE 760 :: FOR B=13 TO 16
    :: READ M$(B):: NEXT B
780 FOR I=1 TO 16 :: U(I)=0 :: NEX
    T I
790 GOSUB 1480 :: C=1 :: GOSUB 159
    0
800 CALL HCHAR(20,3,95,29):: FOR B
    =21 TO 24 :: DISPLAY AT(B,1):M
    $(B-8):: NEXT B
810 DISPLAY AT(1,1):"MONTH? 1   ('0
    '=BACK TO MENU)" :: DISPLAY AT
    (2,9):RPT$(" ",10)
820 ACCEPT AT(1,8)SIZE(-2)VALIDATE
    (DIGIT)BEEP:M :: IF M<0 OR M>1
    2 THEN 810
830 IF M=0 THEN 300
840 C=16-LEN(M$(M))/2 :: DISPLAY A
    T(1,1):RPT$(" ",53):: DISPLAY
    AT(1,C):M$(M):TAB(C-1);RPT$("_
    ",LEN(M$(M))+2)
850 IF U(M)=1 THEN 860 ELSE RESTOR
    E #1,REC M*2-1
860 FOR I=1 TO A :: IF U(M)=1 THEN
     870 ELSE INPUT #1:AK(I,M),
870 DISPLAY AT(I+2,16):USING 200:A
    K(I,M):: NEXT I
880 IF U(M)=1 THEN 890 ELSE INPUT
    #1:T(M),SA(M),EX(M),P(M),NP(M)
890 DISPLAY AT(21,16):USING 200:T(
    M):: DISPLAY AT(22,16):USING 2
    00:SA(M)
900 DISPLAY AT(23,16):USING 200:EX
    (M):: DISPLAY AT(24,16):USING
    200:P(M)
910 IF NP(M)=0 THEN U(M)=1 :: GOTO
     960
920 FOR B=1 TO NP(M)
930 IF U(M)=1 THEN 940 ELSE INPUT
    #1:IT(B,M),X(B,M),
940 DISPLAY AT(IT(B,M)+2,22):"(-"&
    STR$(X(B,M))&")"
950 NEXT B :: U(M)=1
960 CALL KEY(0,K,S):: IF S=0 THEN
    960 :: GOTO 810
970 ! INPUT SUBROUTINE
980 FOR A=A+1 TO 16
990 DISPLAY AT(10,1)ERASE ALL:"ENT
    ER NAME OF ITEM ";STR$(A);".":
     :"IF ALL ITEMS ARE COMPLETE,"
    : :"PRESS ENTER:"
1000 ACCEPT AT(14,14)SIZE(14)VALIDA
    TE(UALPHA,"-'")BEEP:I$(A):: IF
     I$(A)="" THEN A=A-1 :: RETURN
1010 DISPLAY AT(10,1)ERASE ALL:"HOW
     MANY TIMES PER YEAR WILL": :"
    MONEY BE DUE ON THIS ITEM?": :
    "(0-4): 1"
1020 ACCEPT AT(14,8)SIZE(-1)VALIDAT
    E(DIGIT)BEEP:PT :: IF PT<0 OR
    PT>4 THEN 1020 ELSE IF PT=0 TH
    EN 1130
1030 DISPLAY AT(6,1)ERASE ALL:"FOR
    EACH PAYMENT, ENTER THE": :"NU
    MBER OF THE MONTH THE": :"PAYM
    ENT IS DUE, AND THE": :"AMOUNT
     TO BE PAID."
1040 DISPLAY AT(15,3):"MONTH";TAB(1
    7);"AMOUNT":TAB(3);"_____";TAB
    (17);"______"
1050 FOR B=1 TO PT :: ACCEPT AT(B+1
    6,5)VALIDATE(DIGIT)BEEP:MO(A,B
    ):: IF MO(A,B)<1 OR MO(A,B)>12
     THEN 1050
1060 DISPLAY AT(B+16,17):"$" :: ACC
    EPT AT(B+16,18)SIZE(4)VALIDATE
    (DIGIT)BEEP:X(A,B):: IF X(A,B)
    <0 THEN 1060
```

Continued on p. 54


BASIC Computer Programs for Business
Beginner's Guide for the UCSD Pascal System
Game Playing with BASIC
Practical Basic Programs
BASIC COMPUTER PROGRAMS IN SCIENCE AND ENGINEERING
INTRODUCTION TO PASCAL INCLUDING UCSD PASCAL
BASIC Computer Programs for Business
Volume 2
Charles D. Sternberg
BASIC Computer Programs for the Home
Don Inman, Ramon Zamora, and Bob Albrecht
TI BASIC
INTRODUCTION TO TI BASIC
Microcomputer Simulations of Casino Games
Hans Sagan
HAYDEN

BASIC COMPUTER PROGRAMS FOR BUSINESS: VOL. 1

By Charles D. Sternberg.

Each program is documented with a description of its functions and operation, a listing in BASIC, a symbol table, sample data, and one or more samples.

Volume 1 contains over 35 programs covering: budgets, depreciation, cash flow, property comparisons, accounts payable, order entry, warehouse locations, inventory turnover analysis, job routine, resource allocation, production scheduling, etc.

paper, **$13.95**
1980, 384 pages, 7×10

NEW

BASIC COMPUTER PROGRAMS FOR BUSINESS: VOL. 2

By Charles D. Sternberg.

A collection of programs (with function and operation documentation) covering the critical facets of business operation: sales planning and analysis, personnel, word processing, mailing lists, price list systems, record control, scheduling systems, etc.

paper, **$14.95**
1982, 376 pages, 7×10

BEGINNER'S GUIDE FOR THE UCSD PASCAL SYSTEM

By Kenneth Bowles.

This highly informative book is written by the originator of the UCSD Pascal System. It is designed as an orientation guide for learning to use the UCSD Pascal System, and features tutorial examples of programming tasks in the form of self-study quiz programs. Once familiar with the system you will find the guide an invaluable reference tool for creating advanced applications.

paper, **$13.95**
1980, 204 pages, 6×9

BASIC COMPUTER PROGRAMS FOR THE HOME

By Charles D. Sternberg.

An invaluable book containing over 75 practical home application programs that will be helpful to the novice or experienced owner in increasing the usefulness of any home computer. Each program is documented with a description of its functions and operation, a listing in BASIC, a symbol table, sample data, and one or more samples.

paper, **$12.95**
1979, 336 pages, 7×10, illus.

GAME PLAYING WITH BASIC

By Donald D. Spencer.

Enjoy the challenge of competition with your computer. Amuse yourself with such games and puzzles as 3-D Tic-tac-toe, Nim, Roulette, Magic Squares, the 15 Puzzle, Baccarat, Knight's Magic Tour, and many others. The writing is nontechnical, allowing almost anyone to understand computerized game playing.

paper, **$12.50**
1977, 176 pages, 6×9, illus.

BASIC COMPUTER PROGRAMS IN SCIENCE AND ENGINEERING

By Jules. H. Gilder.

Save time and money with this collection of 114 ready-to-run BASIC programs for the hobbyist and engineer. There are programs to do such statistical operations as means, standard deviation averages, curve-fitting, and interpolation. There are programs that design antennas, filters, attenuators, matching networks, plotting, and histogram programs.

paper, **$12.95**
1980, 160 pages, 6×9, illus.

PRACTICAL BASIC PROGRAMS

Edited by Lon Poole

Here is a new collection of 40 programs you can easily key in and use on most microcomputers. Each program does something useful. Practical BASIC Programs is especially useful in small business applications. It solves problems in finance, management decision, mathematics and statistics. It requires no prior programming knowledge. Each program is thoroughly documented. The book contains sample runs, practical problems, BASIC source listings, and an easy to follow narrative to help you realize the potential uses of each program.

paper, **$17.50**
1980, 200 pages, 8½×11

INTRODUCTION TO TI BASIC

By D. Inman, R. Zamora,
and R. Albrecht.

This comprehensive work will teach you all about computer and BASIC for use with the Texas Instruments Home Computer. Even if you've never worked with a computer, you can now teach yourself how to use, program and enjoy the TI Home Computer with this entertaining, and easy-to-read work. The authors have carefully constructed this introduction so that you will soon be writing BASIC programs and exploiting all of the excellent features of the TI machines. Its 14 chapters and Appendices cover all of the essential programming statements and machine features.

paper, **$13.95**
1980, 384 pages, 7×10

INTRODUCTION TO PASCAL (INCLUDING UCSD PASCAL)

By Rodnay Zaks

This is the first book on Pascal that can be used by persons who have never programmed before, but more generally it is a simple and comprehensive introduction to standard and UCSD Pascal for anyone—beginner to experienced programmer—who wants to learn the language rapidly. The logical progression and graduated exercises—designed to provide practice as well as test skill and comprehension—enable the reader to begin writing simple programs almost immediately.

paper, **$17.9**
1981, 440 pages, 7×9

BEAT THE ODDS: MICRO-COMPUTER SIMULATIONS OF CASINO GAMES

By Hans Sagan.

Here's an extremely useful programming guide that provides realistic simulations of five popular Casino games Trente-et-Quarante (Thirty and Forty), Roulette, Chemin-de-Fer, Craps, and Blackjack. Each of the five chapters has the same structure. It begins with a computer run, displaying facets of the programs, followed by an explanation of the objectives and the physical execution of the game. Acceptable bets and how to place them are discussed and systems and/or strategies laid out Finally, the computer program is developed and various modifications of the program are detailed.

paper, **$10.9**
1980, 128 pages, 6×

Use the order card in the back of this magazine, or itemize your order on a separate piece of paper and mail to:
99'er HCM/Book Dept., P.O. Box 5537, Eugene, Oregon 97405. Be sure to include check or
detailed credit card information. Shipping and Handling: In U.S.A.—$2.50 for one book; 75¢ for each
additional book. Foreign Surface—add $3.00 to total U.S.A. shipping costs. Please allow 4-6 weeks for delivery.
If there is a question regarding your order please write to Customer Service at the above address.
PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

99'er BUYERS GUIDE™

A Bound-In Supplement for Subscribers
of 99'er Home Computer Magazine

YOU CAN'T GET IT CHEAPER, FASTER, OR MORE RELIABLY

Here at KEYSTONE, we like to call ourselves TEXAS BIG— and that's no empty boast. We are the largest national distributor of TI calculators, learning aids, and home computer hardware and software in the United States.

And we got that way by giving big deals, big discounts, big service, and the fastest delivery from our big inventory of TI products.

Ask us about TI's latest smash hit, the CC-40 Compact Computer

Call or write for our FREE catalog.

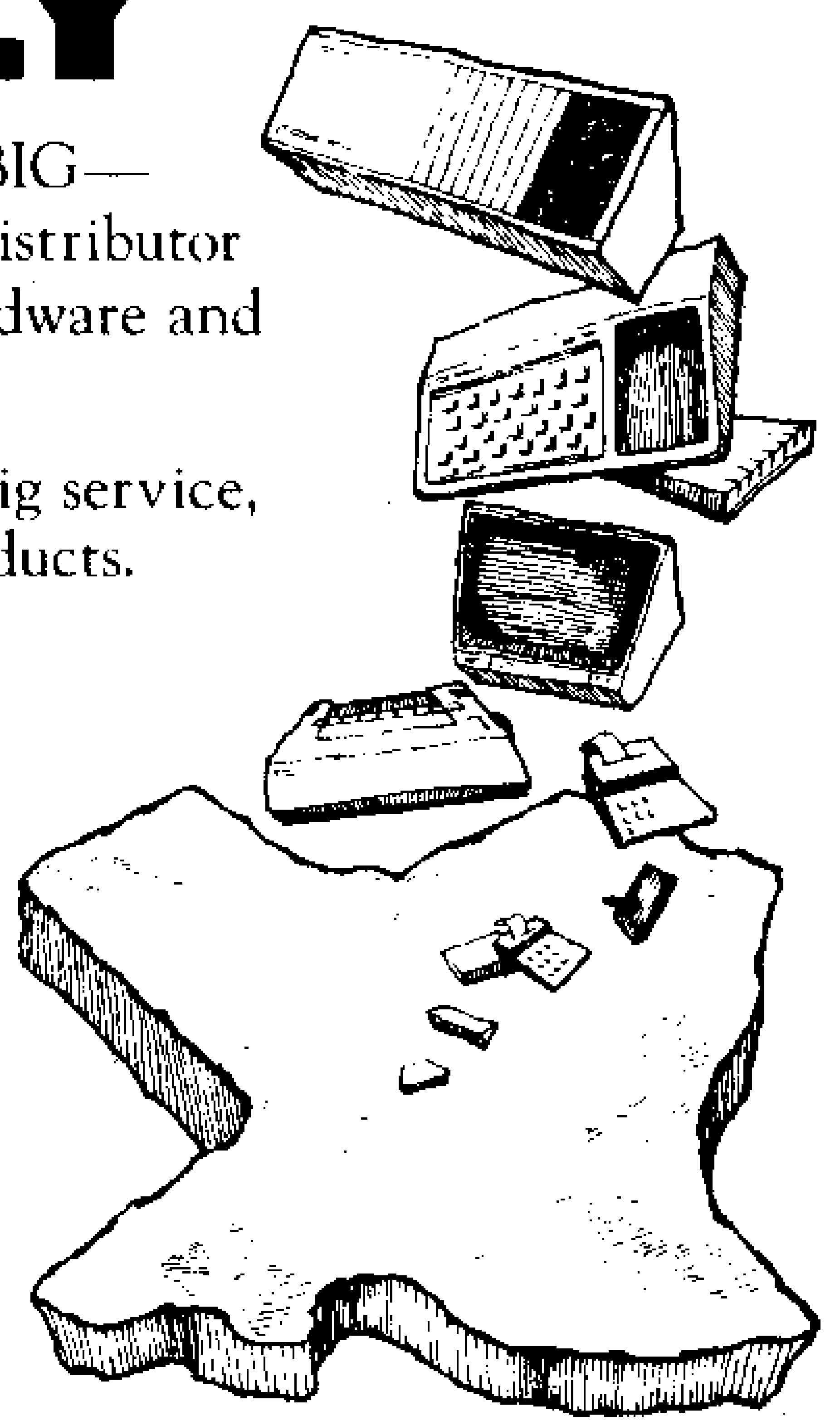
We're Texas Big

KEYSTONE DISTRIBUTING COMPANY

Authorized Texas Instruments Distributor

51 Morgan Drive • Norwood, MA 02062

(617) 769-3225 Out of state call toll free (800) 343-9030

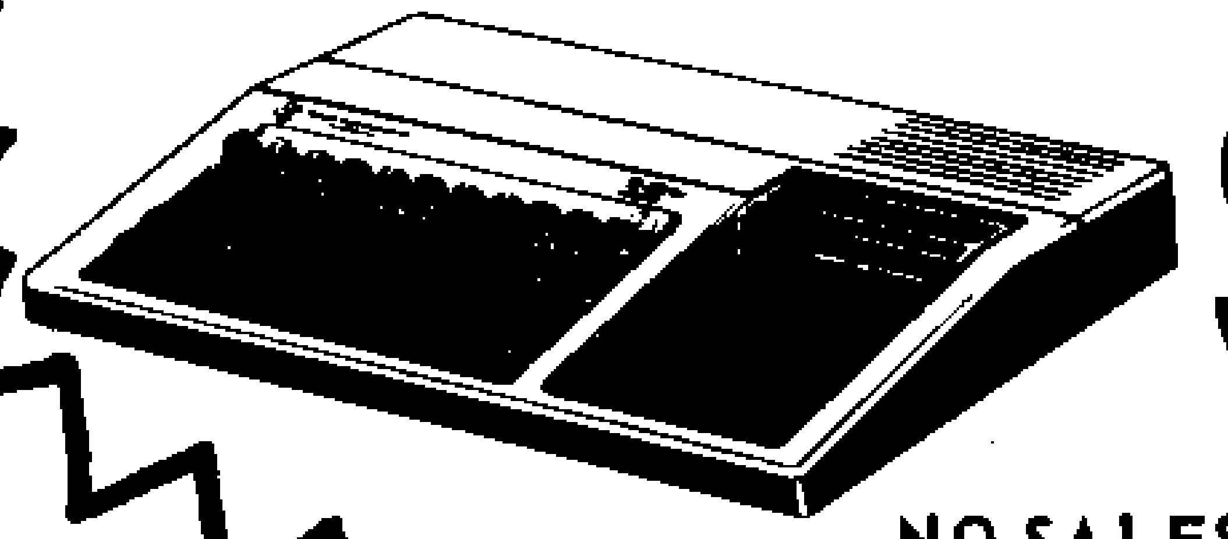


MICRO
CANADIAN
WORKS

SUPER
SUMMER
SPECIAL

**Texas Instruments
Home Computer**

TI 99/4A CONSOLE plus
TI PROGRAM RECORDER



$299
CANADIAN FUNDS

NO SALES TAX

PACKAGE
Consists of

PHC 004A	CONSOLE
PHP 2700	CASSETTE RECORDER
PHA 2100	R F MODULATOR
PHA 2622	CASSETTE CABLE
PHA 2602	BASIC MANUAL
PHA 2603	REFERENCE GUIDE
PHT 6007	TEACH BASIC CASSETTE

delivery: June 1
BY FIRST CLASS MAIL
Cassette Recorder Direct from TI

WRITE FOR OUR
PRICE LIST
OF ALL
TEXAS
INSTRUMENTS
HOME COMPUTER
PRODUCTS

MICRO
CANADIAN
WORKS
BOX 6221, STATION C, EDMONTON
ALBERTA T5B 4K6

PAYMENT & DELIVERY: All prices quoted are in Canadian Funds. For faster delivery, pay by certified cheque or money order. Personal cheques take two weeks to clear. At these prices, we do not provide Credit Card sales. We can provide all items on the TI Canadian price list. Add $5.00 per order for postage & handling. Do not remit sales tax. All prices subject to change. Answering service: 403 461-0074; we'll call back collect. No direct sales.

EDUCATIONAL
TI SOFTWARE

WE PUT EDUCATION AT THE TOP OF OUR LIST!

Early Learning Fun	$24.95
Beginning Grammer	$24.95
Number Magic	$16.95
Computer Math Games	$31.95
Early Reading (speech)	$44.95
Reading On	$43.95
Scholastic Spelling (speech)	$43.95
Milliken Addition Thru Equations	$31.95
Alligator Mix (remote control)	$34.95

OVER 100 CHOICES

$3.00 SHIPPING & HANDLING
Prices subject to change without notice.

Ask for our recommended list which has been evaluated by School Districts for over 2 years!

We handle a complete line of hardware & software and would be happy to provide bid quotations for any School District.

AsTIroids ARTHROPOD
$24.95 each
DOW 4 - GAZELLE

Call or write for details:

K.A. David's
P.O. BOX 2263, PGH., PA 15230
(412) 366-8050 5 - 9 pm EDT

VISA · MASTERCHARGE

STOP

LOOK NO FURTHER
WE HAVE IT ALL !!

Hardware
Software
Accessories
FOR YOUR 99/4A

From Third Party to the
complete TI line.

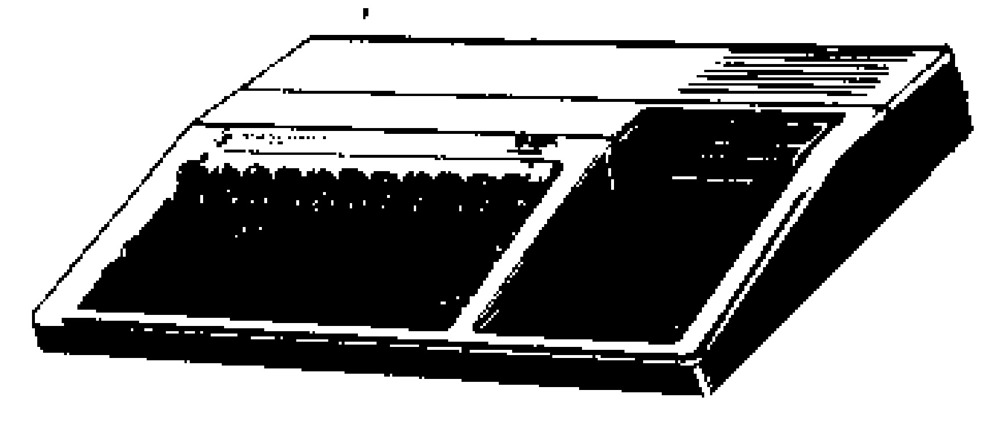
for catalog write:

COMPRO SYSTEMS
P.O. Box 33173
Cleveland, Ohio 44133

HUGE ELEK-TEK DISCOUNTS

TI-99/4A COMPUTER KEYBOARD

by TEXAS INSTRUMENTS



TI-99/4A Keyboard 149.00
Less Mfr. Rebate 50.00
Price After Rebate 99.00
Limited Time Offer

EXTRA BONUS

SAVE $180

FREE PHP1200 PERIPHERAL EXPANSION BOX
with purchase of any 3 following items:

PHP 1220 RS 232 Card
PHP 1240 Disk Controller Card
PHP 1250 Expansion System Disk Drive
PHP 1260 Memory Expansion Card 32K RAM
PHP 1270 P-C Code Card
PHM 3111 TI Writer (Word Processing Pkg.)
PHM 3113 Microsoft Multiplan (Spread Sheet)

LIMITED TIME OFFER

Model	Name	Mfr. Sugg. Ret.	Elek-Tek Price
CONSOLE			
PHC 004A	TI-99/4A Home Computer (incl. RF Modulator)	225.00	**149.00**
PERIPHERALS			
PHP 1200	Peripheral Expansion Box	249.95	**160.00**
PHP 1220	RS-232 Card	174.95	**130.00**
PHP 1240	Disk Controller Card (One Disk Manager module packed with each Disk Controller)	249.95	**180.00**
PHP 1250	Expansion System Disk Drive (Disk Drive Controller required)	399.95	**285.00**
WAB-11	Blank Disks		**20.00**
PHP 1260	Memory Expansion Card (32K RAM)	299.95	**215.00**
PHP 1270	P-Code Card (32K RAM Memory Expansion required)	249.95	**180.00**
PHP 1500	Solid State Speech™ Synthesizer	149.95	**80.00**
PHP 1600	Acoustic Coupler Modem	224.95	**145.00**
PHP 1850	Disk Memory Drive (Exterior)	499.95	**370.00**
PHP 2500	TI 80 Column Impact Printer	750.00	**500.00**
PHP 2700	Program Recorder (includes PHA 2622)	69.95	**50.00**
PHA 4100	10" Color Monitor	399.95	**320.00**
OPTIONAL ACCESSORIES			
PHP 1100	Wired Remote Controllers (Pair)	34.95	**28.00**
PHA 1950	Thermal Paper (2 Pack)	9.95	**8.00**
PHA 2000	Cassette Cable	14.95	**12.00**
PHA 2010	Monitor Cable	19.95	**15.00**
PHP 2700	Cassette Recorder	65.00	**52.00**
APPLICATION PROGRAMS			
Home Management/Personal Finance			
	Command Modules		
PHM 3006	Home Financial Decisions	29.95	**24.00**
PHM 3007	Household Budget Management (Data storage system is required)	39.95	**32.00**
PHM 3012	Securities Analysis	54.95	**32.00**
PHM 3013	Personal Record Keeping (Data storage system is recommended)	49.95	**40.00**
PHM 3016	Tax/Investment Record Keeping (Disk system is recommended)	69.95	**56.00**
PHM 3022	Personal Real Estate (Data storage system is recommended)	69.95	**56.00**
PHM 3044	Personal Report Generator (Data storage system is recommended)	49.95	**32.00**
PHM 3111	TI Writer (32K Memory Expansion required)	99.95	**75.00**
PHM 3113	Microsoft™ Multiplan™ (32K Memory Expansion required)	99.95	**75.00**
	Diskette		
PHD 5001	Mailing List	69.95	**56.00**
PHD 5003	Personal Financial Aids	19.95	**16.00**
PHD 5021	Checkbook Manager	19.95	**16.00**
PHD 5022	Business Aids Library—Finance Management (Extended BASIC Command Module is required)	39.95	**32.00**
PHD 5024	Business Aids Library—Inventory Management (Personal Record Keeping or Statistics Command Module is required)	69.95	**56.00**
PHD 5027	Business Aids Library—Invoice Management (Personal Record Keeping or Statistics Command Module is required)	69.95	**56.00**
PHD 5029	Business Aids Library—Cash Management (Extended BASIC Command Module is required)	39.95	**32.00**
PHD 5038	Business Aids Library—Lease/Purchase Decisions	69.95	**56.00**
	Cassette		
PHT 6003	Personal Financial Aids	14.95	**12.00**
PHT 6038	Business Aids Library—Lease/Purchase Decisions	59.95	**45.00**
Documentation Section for Young Minds			
PHA 2606	Creative Programming Computer Competency Series—Volume 1	9.95	**8.00**
PHA 2607	Creative Programming Computer Competency Series—Volume II	9.95	**8.00**
PHA 2608	Creative Programming Computer Competency Series—Volume III	9.95	**8.00**
PHA 2609	Creative Programming Computer Competency Series—Allstar Projects	9.95	**8.00**
Educational/Personal Enrichment			
	Command Modules		
DLM Arcademics			
PHM 3114	Alligator Mix††††	39.95	**32.00**
PHM 3116	Demolition Division	39.95	**32.00**
PHM 3118	Minus Mission††††	39.95	**32.00**
PHM 3169	Word Invasions (4th quarter)	39.95	**32.00**
PHM 3185	Word Reader (4th quarter)	39.95	**32.00**
Texas Instruments Packages			
PHM 3002	Early Learning Fun	29.95	**24.00**
PHM 3003	Beginning Grammar	29.95	**24.00**
PHM 3004	Number Magic	19.95	**16.00**
PHM 3005	Video Graphs	19.95	**16.00**
PHM 3008	Video Chess	69.95	**56.00**
PHM 3010	Physical Fitness	29.95	**24.00**
PHM 3020	Music Maker (Data storage system is recommended)	39.95	**32.00**
PHM 3021	Weight Control and Nutrition (Data storage system is recommended)	59.95	**32.00**
PHM 3040	TI LOGO (Memory Expansion is required)	129.95	**75.00**
PHM 3064	Touch Typing Tutor* (Available for TI-99/4A only)	39.95	**32.00**
PHM 3109	TI Logo II* (32K Memory Expansion is required)	129.95	**75.00**
PHM 3144	Logo Learning Fun	39.95	**32.00**
Scott, Foresman Reading and Math Packages (Developed by Scott, Foresman)			
PHM 3015	Early Reading (Solid State Speech™ Synthesizer is required)	54.95	**44.00**
PHM 3043	Reading Fun (Solid State Speech™ Synthesizer is recommended)	54.95	**44.00**
PHM 3046	Reading On	54.95	**44.00**
PHM 3047	Reading Roundup	54.95	**44.00**
PHM 3048	Reading Rally	54.95	**44.00**
PHM 3082	Reading Flight	54.95	**44.00**
PHM 3027	Addition and Subtraction I (Solid State Speech™ Synthesizer is recommended)	39.95	**32.00**

TI-PLATO® Courseware

(Disk system, 32K mem. exp. and PLATO interpreter cartridge are required)

			Availability Expected
Elementary			
Grades 1-8	Mathematics	PHD 5201-PHD 5219	(December)
Grades 1-8	Reading	PHD 5220-PHD5247	(September)
Grades 1-8	Grammar	PHD 5248-PHD 5264	(December)
High School			
Grades 9-12	Writing	PHD 5265-PHD 5272	(October)
Grades 9-12	Mathematics	PHD 5273-PHD 5280	(September)
Grades 9-12	Reading	PHD 5281-PHD 5280	(September)
Grades 9-12	Science	PHD 5290-PHD 5298	(December)
Grades 9-12	Social Studies	PHD 5299-PHD 5308	(October)

Each of the above ELEK-TEK Priced at $40.00

Model	Name	Price
PHM 3122	Plato Interpreter Cartridge	40.00

PLATO is a trademark of Control Data Corp.

Model	Name	Mfr. Sugg. Ret.	Elek-Tek Price
PHM 3028	Addition and Subtraction II (Solid State Speech™ Synthesizer is recommended)	39.95	**32.00**
PHM 3029	Multiplication I (Solid State Speech™ Synthesizer is recommended)	39.95	**32.00**
PHM 3049	Division I (Solid State Speech™ Synthesizer is recommended)	39.95	**32.00**
PHM 3050	Numerations I	39.95	**32.00**
PHM 3051	Numerations II	39.95	**32.00**
Scholastic Packages (Developed by Scholastic, Inc.)			
PHM 3059	Scholastic Spelling—Level 3 (Solid State Speech™ Synthesizer is required)	59.95	**45.00**
PHM 3060	Scholastic Spelling—Level 4 (Solid State Speech™ Synthesizer is required)	59.95	**45.00**
PHM 3061	Scholastic Spelling—Level 5 (Solid State Speech™ Synthesizer is required)	59.95	**45.00**
PHM 3062	Scholastic Spelling—Level 6 (Solid State Speech™ Synthesizer is required)	59.95	**45.00**
Addison-Wesley Computer Math Games (Developed by Addison-Wesley Publishing Co.)			
PHM 3083	Computer Math Games II	39.95	**32.00**
PHM 3084	Computer Math Game I (4th quarter)	39.95	**32.00**
PHM 3085	Computer Math Games III	39.95	**32.00**
PHM 3086	Computer Math Games IV	39.95	**32.00**
PHM 3088	Computer Math Games VI	39.95	**32.00**
Milliken Home Math Series—K thru 8th grade (Developed by Milliken Publishing Co.)			
PHM 3090	Addition*	39.95	**32.00**
PHM 3091	Subtraction*	39.95	**32.00**
PHM 3092	Multiplication*	39.95	**32.00**
PHM 3093	Division*	39.95	**32.00**
PHM 3094	Integers*	39.95	**32.00**
PHM 3095	Fractions*	39.95	**32.00**
PHM 3096	Decimals*	39.95	**32.00**
PHM 3097	Percents*	39.95	**32.00**
PHM 3098	Number Readiness	39.95	**32.00**
PHM 3099	Laws of Arithmetic	39.95	**32.00**
PHM 3100	Equations	39.95	**32.00**
PHM 3101	Measurement Formulas	39.95	**32.00**
	Diskette		
Texas Instruments Packages			
PHD 5007	Teach Yourself BASIC	34.95	**28.00**
PHD 5009	Music Skills Trainer	29.95	**24.00**
PHD 5011	Computer Music Box	19.95	**16.00**
PHD 5018	Market Simulation	19.95	**16.00**
PHD 5019	Teach Yourself Extended BASIC (Extended BASIC Command Module is required)	24.95	**20.00**
PHD 5020	Music Maker Demonstration (Music Maker Command Module is required)	14.95	**12.00**
PHD 5023	Basketball Statistics (Extended BASIC Command Module is required)	24.95	**20.00**
PHD 5026	Bridge Bidding I	29.95	**24.00**
PHD 5030	Speak & Spell™ Program (Solid State Speech™ Synthesizer is required)	29.95	**24.00**
PHD 5031	Speak & Math™ Program (Solid State Speech™ Synthesizer and Terminal Emulator II are required)	29.95	**24.00**
PHD 5039	Bridge Bidding II	29.95	**24.00**
PHD 5041	Bridge Bidding III	29.95	**24.00**
PHD 5042	Speller Writer (Terminal Emulator II Command Module and Solid State Speech™ Synthesizer are required)	29.95	**24.00**
PHD 5067	Beginner's BASIC/Tutor	29.95	**24.00**
	Cassette		
PHT 6007	Teach Yourself BASIC	29.95	**24.00**
PHT 6009	Music Skills Trainer	24.95	**9.00**
PHT 6011	Computer Music Box	14.95	**9.00**
PHT 6018	Market Simulation	14.95	**12.00**
PHT 6019	Teach Yourself Extended BASIC (Extended BASIC Command Module is required)	19.95	**16.00**
PHT 6026	Bridge Bidding I	24.95	**12.00**
PHT 6031	Speak & Math™ Program (Solid State Speech™ Synthesizer and Terminal Emulator II are required)	24.95	**12.00**
PHT 6039	Bridge Bidding II	24.95	**12.00**
PHT 6041	Bridge Bidding III	24.95	**12.00**
PHT 6042	Spell Writer (Terminal Emulator II Command Module and Solid State Speech™ Synthesizer are required)	24.95	**12.00**
PHT 6067	Beginner's BASIC Tutor	24.95	**20.00**
Entertainment			
	Command Modules		
Texas Instruments Packages			
PHM 3009	Football	29.95	**24.00**
PHM 3018	Video Games I	29.95	**24.00**
PHM 3023	Hunt the Wumpus	24.95	**20.00**
PHM 3024	Indoor Soccer	29.95	**24.00**
PHM 3025	Mind Challengers	24.95	**20.00**
PHM 3030	A-Maze-Ing	24.95	**20.00**
PHM 3031	Moonmine	39.95	**32.00**
PHM 3052	Tombstone City: 21st Century	39.95	**32.00**
PHM 3053	TI Invaders	39.95	**32.00**
PHM 3054	Car Wars	39.95	**32.00**
PHM 3057	Munch Man	39.95	**32.00**
PHM 3042D	Tunnels of Doom (2 Diskette Games Included)	59.95	**45.00**
PHM 3042T	Tunnels of Doom (2 Cassette Games Included)	59.95	**45.00**
PHM 3056	Alpiner*	39.95	**32.00**
PHM 3110	Chisholm Trail	39.95	**32.00**
PHM 3112	Parsec*	39.95	**32.00**
PHM 3146	Sneggit	39.95	**32.00**
PHM 3158	MASH (by 20th Century Fox)	39.95	**32.00**
Milton Bradley Packages (Developed by Milton Bradley Company)			
PHM 3031	The Attack††	39.95	**32.00**
PHM 3032	Blasto††	24.95	**20.00**
PHM 3033	Blackjack and Poker††	24.95	**20.00**
PHM 3034	Hustle††	24.95	**20.00**
PHM 3036	ZeroZap††	19.95	**16.00**
PHM 3037	Hangman††	19.95	**16.00**
PHM 3038	Connect Four††	19.95	**16.00**
PHM 3039	Yahtzee††	24.95	**20.00**
Adventure International Packages (Developed by Scott Adams)			
PHM 3041D	Adventure (Pirate Adventure Diskette Game Included)	49.95	**32.00**
PHM 3041T	Adventure (Pirate Adventure Cassette Game Included)	49.95	**32.00**
Gabriel Industries Packages (Developed by Gabriel Industries)			
PHM 3067	Othello† (Developed by Gabriel Industries)	39.95	**32.00**
	Diskette		
Texas Instruments Packages			
PHD 5002	TI-Trek (with optional speech)	14.95	**12.00**
PHD 5010	Mystery Melody	14.95	**12.00**
PHD 5015	Oldies But Goodies—Games I	19.95	**16.00**
PHD 5017	Oldies But Goodies—Games II	24.95	**20.00**
PHD 5025	Saturday Night Bingo (Solid State Speech™ Synthesizer is required)	29.95	**24.00**
PHD 5037	Draw Poker (Extended BASIC Command Modules is required)	24.95	**20.00**
PHD 5057	Tombstone City 21st Century (32K Memory Expansion and Extended BASIC Command Module are required)	19.95	**16.00**
PHD 5058	TI Invaders (32K Memory Expansion and Either Extended BASIC or Editor/Assembler Command Module are required)	19.95	**16.00**
PHD 5060	Munch Man (32K Memory Expansion and Either Extended BASIC or Editor/Assembler Command Module are required)	19.95	**16.00**
Adventure International Adventure Series (Developed by Scott Adams) (PHM 3041D required)			
PHM 5046	Adventureland	29.95	**24.00**
PHD 5047	Mission Impossible	29.95	**24.00**
PHD 5048	VooDoo Castle	29.95	**24.00**
PHD 5049	The Count	29.95	**24.00**
PHD 5050	Strange Odyssey	29.95	**24.00**
PHD 5051	Mystery Fun House	29.95	**24.00**
PHD 5052	Pyramid of Doom	29.95	**24.00**
PHD 5053	Ghost Town	29.95	**24.00**
PHD 5054	Savage Island I & II	39.95	**32.00**
PHD 5056	Golden Voyage	29.95	**24.00**
	Cassette		
Texas Instruments Packages			
PHT 6010	Mystery Melody	9.95	**9.00**
PHT 6015	Oldies But Goodies—Games I	14.95	**9.00**
PHT 6017	Oldies But Goodies—Games II	19.95	**9.00**
PHT 6025	Saturday Night Bingo (Solid State Speech™ Synthesizer is required)	24.95	**9.00**
PHT 6037	Draw Poker	19.95	**9.00**
PHT 6101	Entrapment (requires Mini Memory)	9.95	**9.00**
Adventure International Adventure Series (Developed by Scott Adams) (PHM 3041T required)			
PHT 6046	Adventureland	29.95	**24.00**
PHT 6047	Mission Impossible	29.95	**24.00**
PHT 6048	Voodoo Castle	29.95	**24.00**
PHT 6049	The Count	29.95	**24.00**
PHT 6050	Strange Odyssey	29.95	**24.00**
PHT 6051	Mystery Fun House	29.95	**24.00**
PHT 6052	Pyramid of Doom	29.95	**24.00**
PHT 6053	Ghost Town	29.95	**24.00**
PHT 6054	Savage Island I & II	39.95	**32.00**
PHT 6056	Golden Voyage	29.95	**24.00**
OTHER APPLICATION PROGRAMS			
	Command Modules		
PHM 3001	Demonstration	69.95	**58.00**
PHM 3011	Speech Editor (Solid State Speech™ Synthesizer is required)	44.95	**32.00**
PHM 3014	Statistics (Data storage system is recommended)	44.95	**32.00**
PHM 3026	Extended BASIC	99.95	**75.00**
PHM 3035	Terminal Emulator II	49.95	**40.00**
PHM 3055	Editor/Assembler	99.95	**40.00**
PHM 3058	Mini-Memory (4K)	99.95	**80.00**
PHM 3045D	SMU Electrical Engineering Library (2 Diskettes included)	149.95	**120.00**
PHM 3045T	SMU Electrical Engineering Library (10 Cassettes included)	149.95	**120.00**
	Diskette		
PHD 5004	Programming Aids I	14.95	**12.00**
PHD 5005	Programming Aids II	24.95	**20.00**
PHD 5006	Math Routine Library	29.95	**24.00**
PHD 5008	Electrical Engineering Library	29.95	**24.00**
PHD 5012	Programming Aids III	19.95	**16.00**
PHD 5013	Graphing Package	19.95	**16.00**
PHD 5016	Structural Engineering Library	29.95	**24.00**
PHD 5044	AC Circuit Analysis	29.95	**24.00**
PHD 5063	UCSD-PASCAL Compiler (32K Memory Expansion and P-Code required)	124.95	**100.00**
PHD 5064	UCSD p-System Assembler/Linker (32K Memory Expansion and P-code required)	99.95	**80.00**
PHD 5065	UCSD p-System Editor/Filer/Utilities (32K Memory Expansion and P-code required)	74.95	**60.00**
PHD 5066	TI PILOT (32K Memory Expansion and P-code required)	79.95	**60.00**
PHD 5069	Course Designer Authoring Package (Extended BASIC required and Video Controller optional)	199.95	**150.00**
PHD 5075	Text-To-Speech (English) a (Solid State Speech™ Synthesizer, 32K Memory Expansion and Extended BASIC Command Module are required)	29.95	**24.00**
	Cassette		
PHT 6004	Programming Aids I	9.95	**9.00**
PHT 6006	Math Routine Library	24.95	**9.00**
PHT 6008	Electrical Engineering Library	24.95	**9.00**
PHT 6013	Graphing Package	14.95	**9.00**
PHT 6016	Structural Engineering Library	24.95	**9.00**
PHT 6044	AC Circuit Analysis	24.95	**9.00**
SOFTWARE LIBRARIES			
PHL 7001	The Home Financial Manager	139.95	**100.00**
PHL 7002	The Family Entertainer	89.95	**65.00**
PHL 7003	The Elementary Educator	99.95	**75.00**
PHL 7004	The Music Educator	64.90	**40.00**
PHL 7005	The Super Programmer	119.00	**90.00**
PHL 7006	The Speaking Math Teacher	119.85	**90.00**
PHL 7007	The Speaking Reading Teacher	109.90	**85.00**
PHL 7008	The Speaking Scholastic Spelling Teacher	219.80	**160.00**
PHL 7009	The TI Arcade Game Series	114.75	**90.00**
PHL 7010	The Milton Bradley Game Series	114.75	**90.00**
PHL 7011	The Computer Introductory Package	119.85	**90.00**
PHL 7012	Key to Spanish (developed by Westinghouse Learning Corp.)	149.95	**120.00**
TI Value Paks			
PHV 1001	Entertainment Value Pak (includes PHM 3032, 3037, 3038, 3041T, 3112, PHT 6017)	99.95	**75.00**
PHV 1002	Variety Value Pak (all cassettes) (includes PHT 6003, 6015, 6018, 6067)	49.95	**40.00**

Texas Instruments Compatible Supplies

Item	Price
Blank 5¼" Diskettes	
Wabash 10 Pack	20.00
Blank 60 Minute Cassettes	
TDKD 60-2 Pack	3.00
Command Module or Cassette Storage File	
Flip-top dust-free Storage Box (holds 18 modules/cassettes)	15.00
Ribbon Cartridges	
For TI PHP 2500 Printer Epson MX-80 Printer	4.00
For Epson MX-100 Printer	7.00
Disc Storage File	
Advance Storage File Holds 50 5¼ Diskettes	16.00
Flip N File Stores 50 5¼ Diskettes	20.00
Joysticks	
Wico 72-9714 Joystick	22.00
Adapter For Above TI-99/4A	8.00

WE CARRY A LARGE VARIETY OF CABLES

Call for very special prices on EPSON and GEMINI Printers.

---

† Developed by Scott, Foresman.
†† Developed by Milton Bradley—The Attack, Blasto, Hustle, ZeroZap. Connect Four and Yahtzee are trademarks of Milton Bradley
††† Developed by Microsoft™ Inc. Multiplan™ is a trademark of Microsoft™ Inc
†††† Developed by DLM, Inc
* Available only until replaced by peripheral card
: UCSD, UCSD Pascal and UCSD p-System are all trademarks of the Regents of the University of California.
· Othello is a trademark of Gabriel Industries
· Course is designed to be used with Circuit Analysis I textbook.

ELEK-TEK, inc.
6557 N. Lincoln Ave., Chicago, IL 60645
(800) 621-1269 (312) 677-7660

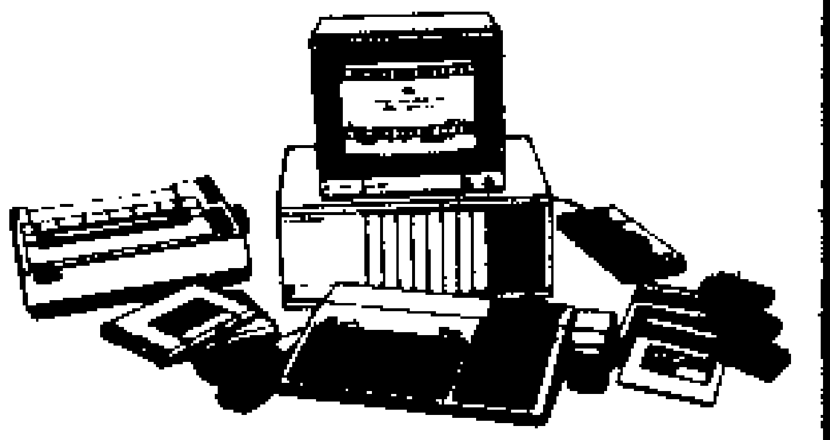
CALL TOLL FREE 800-621-1269 (EXCEPT, IL, AK, HI) MasterCard or Visa by mail or phone. Mail Cashier's Ck., Mon. Ord., Pers. Ck. (2 wks to clr). Add $4.00 1st item. **(AK, HI, P.R., Canada add $10.00 1st item *except* large peripherals)** $1.00 ea. add'l shpg. & handl. Shipments to IL address add 6% tax. Prices subject to change. **Write (no calls) for free catalog. 30 day return policy applies to defective merchandise ONLY and limited to U.S. shipments. Sorry, no other exchanges or refunds since ALL MERCHANDISE SOLD BY ELEK-TEK IS BRAND NEW, FIRST QUALITY AND COMPLETE.**

Authorized Dealer

TI-99/4A
$99.95
with rebate

TEX-COMP™

TI USERS SUPPLY COMPANY
"YOUR LUBBOCK CONNECTION™"



TI-99/4 PRODUCTS AT PROFESSIONAL PRICES

ATTENTION TI-99/4 USERS   TEX COMP HAS BEEN SUPPORTING THE ENTIRE 99/4 PRODUCT LINE TO PROFESSIONAL AND INDUSTRIAL ACCOUNTS, SINCE THE INTRODUCTION OF THE TI-99/4. NOW YOU CAN PURCHASE ALL YOUR TI-99/4 REQUIREMENTS FROM ONE SOURCE AT LOW "PROFESSIONALLY DISCOUNTED" PRICES ON THE **ENTIRE** 99/4 PRODUCT LINE. WE ARE A DIRECT TI NATIONAL ACCOUNT AND DEAL DIRECTLY WITH TI, ASSURING YOU THE BEST SERVICE, EARLIEST SHIPMENT AND LOWEST POSSIBLE PRICES.

SEND FOR FREE ORDER KIT AND COMPLETE PRICE LIST
CONTAINS MONEY SAVING SPECIAL OFFERS AND NEW PRODUCT INFORMATION

FREE SHIPPING ON SOFTWARE ORDERS OVER $100. (PHD, PHM, PHT)

TEX-COMP USERS SUPPLY
P.O.BOX 33084, GRANADA HILLS, CA 91344

213-366-6631
HOT LINE

TI-99/4 PRODUCT LINE *Your Cost*

CONSOLE

PHC 004A **TI-99/4A Home Computer** (less Modutator) · **$149.95**
($99.95 with rebate)

PERIPHERALS

PHP	1200	Peripheral Expansion System	178.95
PHP	1220	RS-232 Card	125.95
PHP	1240	Disk Controller Card* (One Disk Manager module packed with each Disk Controller)	178.95
PHP	1250	Expansion System Disk Drive (Disk Drive Controller required)	269.95
PHP	1260	Memory Expansion Card (32K RAM)	214.95
PHP	1270	P-Code Card (32K RAM Memory Expansion required)	178.95
PHP	1280	Pascal Development System — Includes P-Code Card (PHP 1270), UCSD Pascal* Compiler (PHD 5063), UCSD P-System Assembler Linker (PHD 5064) and UCSD P-System Editor Filer Utilities (PHD 5065) (32K Memory Expansion, Disk Drive and Controller are required)	357.95
PHP	1500	Solid State Speech™ Synthesizer	107.95

FREE EXPANSION BOX ....send for details

Cassette recorder & cable 59.95

PHP	1850	Disk Memory Drive (Disk Drive Controller required)	357.95
PHP	2500	TI Impact Printer	519.95
PHA	2100	RF Modulator (TV Adapter)	36.95
PHA	4100	10" Color Monitor	312.95

OPTIONAL ACCESSORIES

PHP	1100	Wired Remote Controllers (Joysticks) (Pair)	26.95
PHA	2000	Dual Cassette Cable	10.95

APPLICATION PROGRAMS
Home Management Personal Finance
Command Modules

PHM	3006	Home Financial Decisions	[illegible]
PHM	3007	Household Budget Management (Data storage system is recommended)	[illegible]
PHM	3012	Securities Analysis	30.95
PHM	3013	Personal Record Keeping (Data storage system is recommended)	38.95
PHM	3016	Tax Investment Record Keeping (Disk system is required)	53.95
PHM	3022	Personal Real Estate (Data storage system is recommended)	53.95
PHM	3044	Personal Report Generator (Data storage system is recommended and PHM 3113 is recommended)	30.95
PHM	3111	TI Writer (32K Memory Expansion, RS232, Printer, Disk Drive and Controller are required) (Available for TI-99/4A only)	74.95
PHM	3113	Microsoft™ Multiplan (32K Memory Expansion, Disk Drive and Controller are required. RS-232 and Printer are recommended.)	74.95

Diskette

PHD	5001	Mailing List	53.95
PHD	5003	Personal Financial Aids	15.95
PHD	5021	Checkbook Manager	15.95
PHD	5077	Personal Tax Plan (Aardvark Software Inc.) (P-Code and 32K Memory Expansion are required. RS232 and Printer are recommended)	74.95

Cassette

PHT	6003	Personal Financial Aids	11.95
PHT	6036	Business Aids Library — Lease Purchase Decisions (Printer is recommended)	46.95

Education Personal Enrichment
Command Modules
Texas Instruments Packages

PHM	3002	Early Learning Fun	22.95
PHM	3003	Beginning Grammer	22.95
PHM	3004	Number Magic	15.95
PHM	3005	Video Graphs	15.95
PHM	3008	Video Chess	53.95
PHM	3010	Physical Fitness	22.95
PHM	3020	Music Maker (Data Storage System is recommended)	30.95
PHM	3021	Weight Control and Nutrition (Data Storage System is recommended)	30.95
PHM	3064	Touch Typing Tutor (Available for TI 99/4A only)	30.95
PHM	3109	TI Logo II (32K Memory Expansion is required)	99.95
PHM	3015	Early Reading (Solid State Speech Synthesizer is required)	41.95
PHM	3043	Reading Fun (Solid State Speech Synthesizer is recommended)	41.95
PHM	3046	Reading On	41.95
PHM	3047	Reading Roundup	41.95
PHM	3048	Reading Rally	41.95
PHM	3082	Reading Flight	41.95
PHM	3027	Addition and Subtraction I (Solid State Speech™ Synthesizer is recommended)	30.95
PHM	3028	Addition and Subtraction II (Solid State Speech™ Synthesizer is recommended)	30.95
PHM	3029	Multiplication I (Solid State Speech™ Synthesizer is recommended)	30.95
PHM	3049	Division I (Solid State Speech™ Synthesizer is recommended)	30.95

Entertainment
Command Modules
Texas Instruments Packages

PHM	3009	Football	22.95
PHM	3018	Video Games I	22.95
PHM	3023	Hunt the Wumpus	19.95
PHM	3024	Indoor Soccer	22.95
PHM	3025	Mind Challengers	19.95
PHM	3030	A-Maze-Ing	19.95
PHM	3052	Tombstone City, 21st Century	30.95
PHM	3053	TI Invaders	30.95
PHM	3054	Car Wars	30.95
PHM	3057	Munch Man	30.95
PHM	3042D	Tunnels of Doom (2 Diskette Games Included)	43.95
PHM	3042T	Tunnels of Doom (2 Cassette Games Included)	43.95
PHM	3056	Alpiner	30.95
PHM	3110	Chisholm Trail	30.95
PHM	3112	Parsec	30.95

Milton Bradley Packages (Developed by Milton Bradley Company)

PHM	3031	The Attack	30.95
PHM	3032	Blasto	19.95
PHM	3033	Blackjack and Poker††	19.95
PHM	3034	Hustle	19.95
PHM	3036	ZeroZap	15.95
PHM	3037	Hangman	15.95
PHM	3038	Connect Four	15.95
PHM	3039	Yahtzee	19.95

Adventure International Packages (Developed by Scott Adams)

PHM	3041D	Adventure (Pirate Adventure Diskette Game Included)	37.95
PHM	3041T	Adventure (Pirate Adventure Cassette Game Included)	37.95

Gabriel Industries Packages (Developed by Gabriel Industries)

PHM	3067	Othello (Developed by Gabriel Industries)	30.95

Adventure International Adventure series (Developed by Scott Adams)

PHT	6046	or	PHD	5046	Adventureland	22.95
PHT	6047	or	PHD	5047	Mission Impossible	22.95
PHT	6048	or	PHD	5048	Voodoo Castle	22.95
PHT	6049	or	PHD	5049	The Count	22.95
PHT	6050	or	PHD	5050	Strange Odyssey	22.95
PHT	6051	or	PHD	5051	Mystery Fun House	22.95
PHT	6052	or	PHD	5052	Pyramid of Doom	22.95
PHT	6053	or	PHD	5053	Ghost Town	22.95
PHT	6054	or	PHD	5054	Savage Island I & II	30.95
PHT	6056	or	PHD	5056	Golden Voyage	22.95

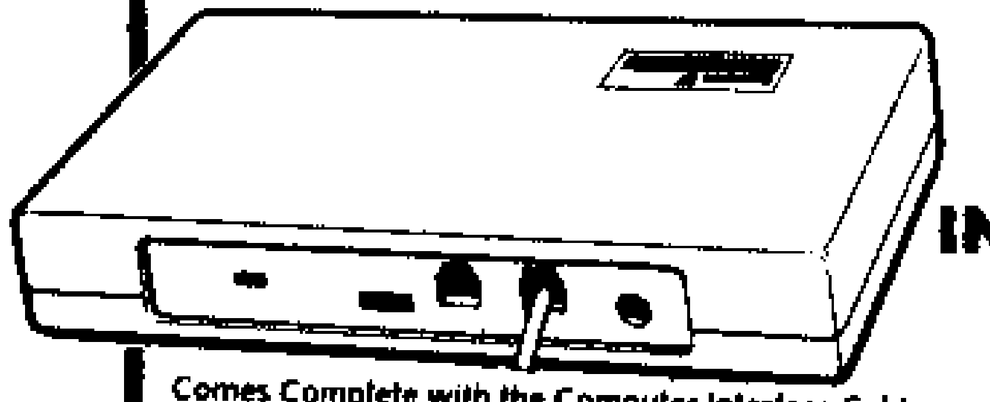
Cassette
Texas Instruments Packages

PHT	6010	Mystery Melody	7.95
PHT	6015	Oldies But Goodies — Games I	10.95
PHT	6017	Oldies But Goodies — Games II	15.95

OTHER APPLICATION PROGRAMS
Command Modules

PHM	3011	Speech Editor (Solid State Speech™ Synthesizer is required)	30.95
PHM	3014	Statistics (Data storage system is recommended)	30.95
PHM	3026	Extended BASIC	74.95
PHM	3035	Terminal Emulator II	38.95
PHM	3055	Editor Assembler (Disk System and 32K RAM Memory Expansion required)	38.95
PHM	3058	Mini Memory	74.95

POSTPAID TI 99/4A ACCESSORIES FROM TEX-COMP



NEW — SIGNALMAN MARK III MODEM

FOR THE 99/4 and 99/4A—DIRECT CONNECT.
INTRODUCTORY OFFER—$94.95 POSTPAID (Sug. list $139.)
TEX-NET™ SPECIAL —TERMINAL EMULATOR II only $34.95
When purchased with MarkIII Modem.

Comes Complete with the Computer Interface Cable and Telephone Cord. Other Modems Require Separate $20-$30 Purchases.

OPTIONAL 9 V BATTERY ELIMINATOR $10.95 POSTPAID

SPECIAL with purchase **FREE Source/Tex-Net sign on and hour use** $100. value

SPECIAL — 10

PREMIUM GRADE
HUB-REINFORCED
DISKETTES &
FREE PLASTIC
LIBRARY CASE
SS-DD $24.95 POSTPAID

NEW DS-DD & flipflop
use both sides on
ANY drive $29.95 POSTPAID

TI99/4A compatible

Beanstalk™ Adventure

The ultimate adventure game based on the classic fairy tale. Jack and the Beanstalk. Now for the TI-99/4 and TI-99/4A.

Minimum Configuration required
1. 99/4 or 99/4A console
2. 1 Disk Drive and Controller *
3. 32K Memory Expansion
4. Extended BASIC Module

$17.95 including shipping and handling.
*Not available on cassette

SPECIAL — $15.95 POSTPAID

JOYSTICK ADAPTER — Allows two Atari wired Joy Sticks to be used with 99/4 or 99/4A. $10.95 with any WICO Joystick

SPECIAL — $15.95 POSTPAID

Head Cleaning Kit • Convenient and easy to use remove the debris contaminating drive heads

SPECIAL — 8

DATA QUALITY C-11

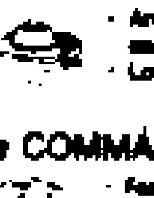
Cassettes (BASF) in FREE Plastic storage case
$9.95 POSTPAID

TI99/4A compatible

WICO COMMAND CONTROL JOY STICKS

IMPORTANT—Joy Sticks require TI adapter $10.95 with Joy Stick.

Joystick 15-9714 **$26.95**
- Extra-long arcade-style bat handle grip that moves smoothly and easily into all 8 standard positions.
- Low-profile, heavy-duty plastic base



Famous Red Ball™ Joystick 15-9730 **$29.95**
- Arcade-type red ball handle that moves smoothly and easily into all 8 standard positions.
- Low-profile, heavy-duty plastic base.

NEW LOW PRICE

The COMMAND CONTROL trackball $44.95

- Features injection-molded modular construction. Phenolic ball provides unique 360 degree movement to an infinite number of positions; can also be used to vary the speed of on-screen objects.
- Quick-action fire button next to the ball, for smooth, two-handed control
- Texas Instruments model* – 72-4580

Flip 'N' File TM For TI Modules and Cassettes

$27.95
POSTPAID •

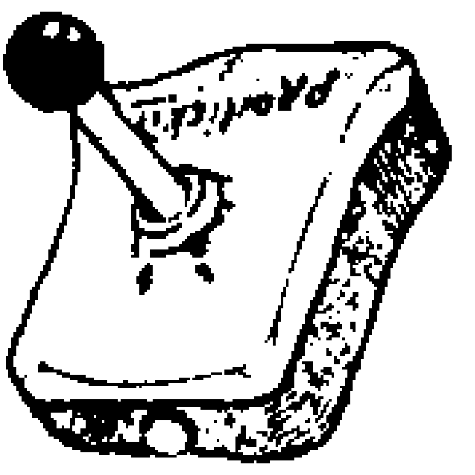
[illegible]

Flip 'N' File TM For 5¼" Mini Disks

$23.95
POSTPAID •

[illegible]

NEW SUPER JOYSTICK II RATED #1



A commercial arcade joy stick adapted for use with your 99/4 or 99/4A. 2-way setting for Munchman and Parsec-a Tex-Comp exclusive
$34.95 postpaid
WITH FREE 2 PORT ADAPTER
2nd unit only $29.95

TERMS: All prices F.O.B. Los Angeles. For fastest service use cashiers check or money order. Personal checks take at least ten days to clear. Add 3% shipping and handling ($3.00 minimum). East of Mississippi 4½%. (Free shipping on all software orders over $100 and on postpaid specials). Add 6½% S.T. for delivery in Calif. Prices and availability subject to change without notice. We reserve the right to limit quantities. *this ad supercedes all previous ads.*

Credit Cards add 3%

MasterCard VISA

Texas Instruments Home Computer

Back-To-School

PHM3004	Number Magic	$15.95
PHM3003	Beg. Grammar	$21.95
PHM3064	Typing Tutor	$29.95
PHM3083	Math Games II	$29.95
PHM3029	Multiplication I	$29.95
PHM3097	Percents	$29.95

PHM3015	Early Reading	$41.95
PHM3026	Extended Basic	$73.95
PHM3111	TI Writer	$73.95

REMEMBER, IT'S ONE-STOP SHOPPING AT DHEIN'S

We carry everything TI makes for the 99/4A Home Computer
as well as the best of the third-party software
ALL AT EVERY-DAY LOW PRICES

COUPON--MAIL TODAY

FREE Subscription to the COMPUTER BULLETIN for the rest of 1983.

Name ____________________
Street ____________ State ________
City ____________ Zip ________

Would you like to have our complete catalog? Send in the coupon or drop us a post card TODAY.

- **Programs you can type in yourself**
- **Feature articles on the 99/4A world**
- **Descriptive price list**

The best combination of Price, Service and Quality is TRUE VALUE. More than just a name, it is our way of doing business.

DHEIN'S True Value HARDWARE STORE ®

(319) 236-3861

7 W. Airline Hwy.
Waterloo, IA 50703

PLEASE HELP US

PLEASE HELP US

IF THERE'S A MAGAZINE SELLER NEAR YOU WHO DOESN'T CARRY 99'er PLEASE SHOW HIM THIS PAGE

Comments From Our Readers

" I purchased my computer without knowing about you, but after seeing many other "computer" magazines, you are light years ahead of the pack."
Tim Williams, Gig Harbor, WA

" . . . your publication is better than Compute, Byte, Popular Computing and Personal Computing. We have canceled other subscriptions in favor of the 99'er.

This is the first time I've ever written a magazine publication and it's only because I'm impressed with the 99/4A and your magazine."
Cindy Eckhardt, Palatka, FL

" . . . I had considered BYTE the most useful of the genre until I saw yours. Absolutely the most valuable source of ideas and suppliers for those of us using a TI-99 Home System."
Dennis E. Clouse, Concord, CA

"I am a programmer/anaylst and I just subscribed to your magazine.

The question is where have you been? I was looking for just the magazine you and your staff publish. I must say it is the best. I have subscribed to Byte, Softside, Creative Computing and Kilobaud, and nothing—I mean nothing—can compare to 99'er."*Sal Melillo, Scotch Plains, NJ*

" . . . Your magazine is a help as well as a great source for software games, books, and hardware. For me the super-novice, this information is invaluable! Keep up the good work!"
David Hurd, Lubbock, TX

" . . . After spending a small fortune subscribing to computer magazines trying to find some information about the 99/4 and/or software for it, the investment has finally realized some fantastic gains with your magazine."
Robert L. Nelson, Suring, WI

And Look At A Typical Comment From The Magazine Trade:

"It sells well!!! In five months, we've increased our draw from 300 to 1000. Our percentage of returns has been: November 10%, December 5%, January 0, February 4%, March 2%. And your service is fine and dandy!"

—Melinda Pleshe, Levity Distributors, No. Hollywood, CA

THE FACTS SPEAK FOR THEMSELVES—

- Since December 1982, our total paid circulation has more than tripled to nearly 200,000 copies per month.
- Our world-wide single-copy sell-through presently averages more than 95% of single-copy distribution—YES, more than 95%!!!
- The $3.50 cover price and liberal discount have made 99'er HCM the most profitable computer title for the wholesale industry to handle.

For More Information on Our Profitable Wholesale Distribution Plan Call:

Coleen Nelson or Ann Crenshaw at
Tel (503) 485-8796
8:00 AM-5:00 PM West Coast Time, or Write:
Bulk Sales Department, 99'er Home Computer Magazine,
1500 Valley River Drive, Suite 250, Eugene, OR 97401

SPECIAL NOTE TO BOOKSELLERS

We also produce a full line of trade books and mass-market paperbacks in the Home Computer field, under our 99'er-WARE imprint. Call or Write for details.

99'er HOME COMPUTER magazine ™

TOLL FREE 800-227-8292

TEXAS INSTRUMENTS

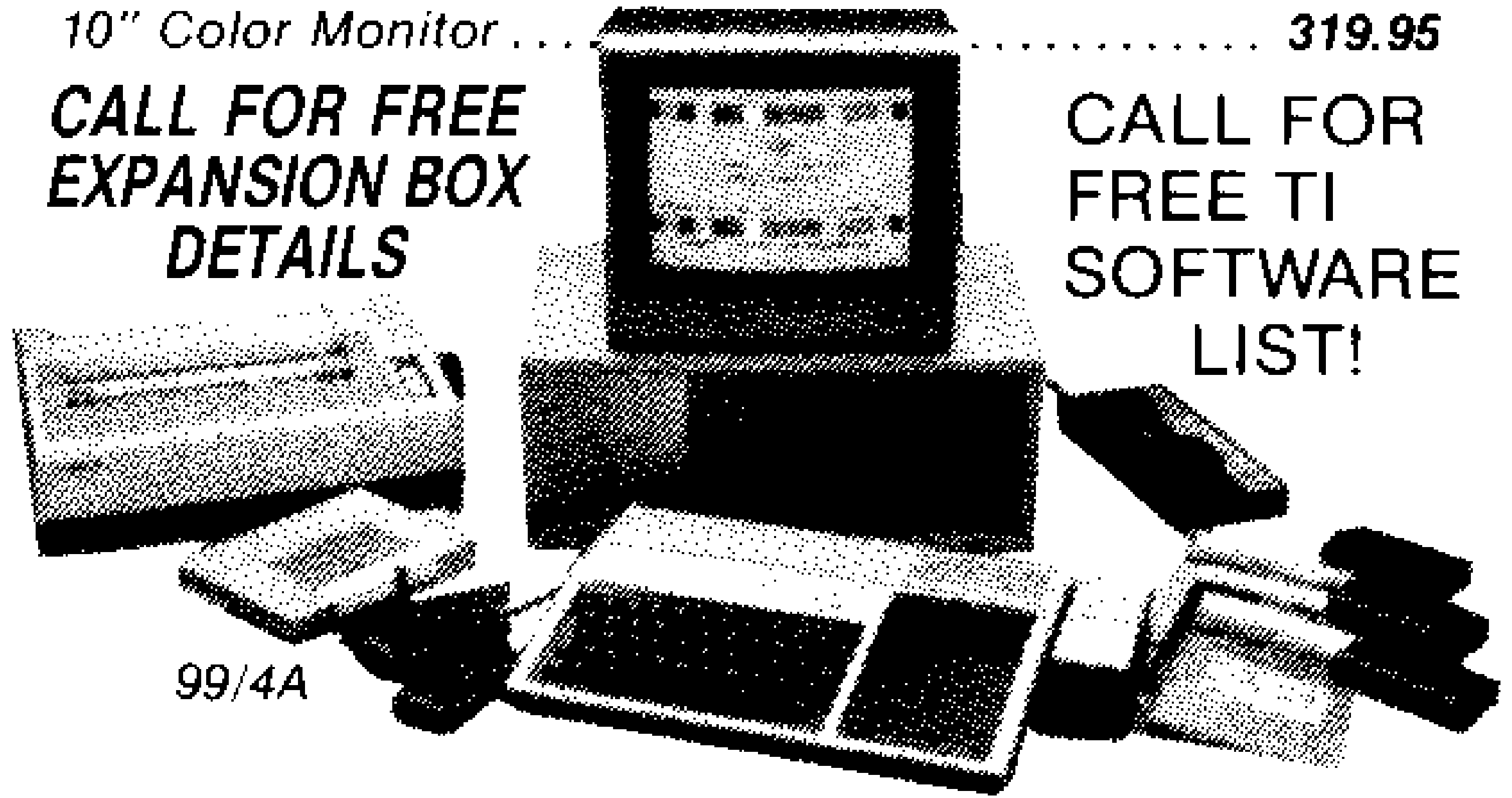
HOME COMPUTER

*Retail price $225. Your special BACH Company price is a low **$149.95. Less TI $50 REBATE - $99.95!** Order today **TOLL FREE 800-227-8292.** In California call 415-969-6600.*

TI Home Computer (includes rebate)	**99.95**
Peripheral Expansion System	**182.95**
RS-232 Card	**134.95**
Disk Controller Card	**192.95**
Expansion System Disk Drive	**297.95**
Maxell MD1 Single Side 5-1/4" Floppy Disk (10)	**29.10**
Memory Expansion Card	**228.95**
P-Code Card	**189.95**
Pascal Development System	**370.50**
Solid State Speech Synthesizer	**108.95**
Telephone Coupler	**158.95**
TI-Impact Printer	**559.00**
10" Color Monitor	**319.95**

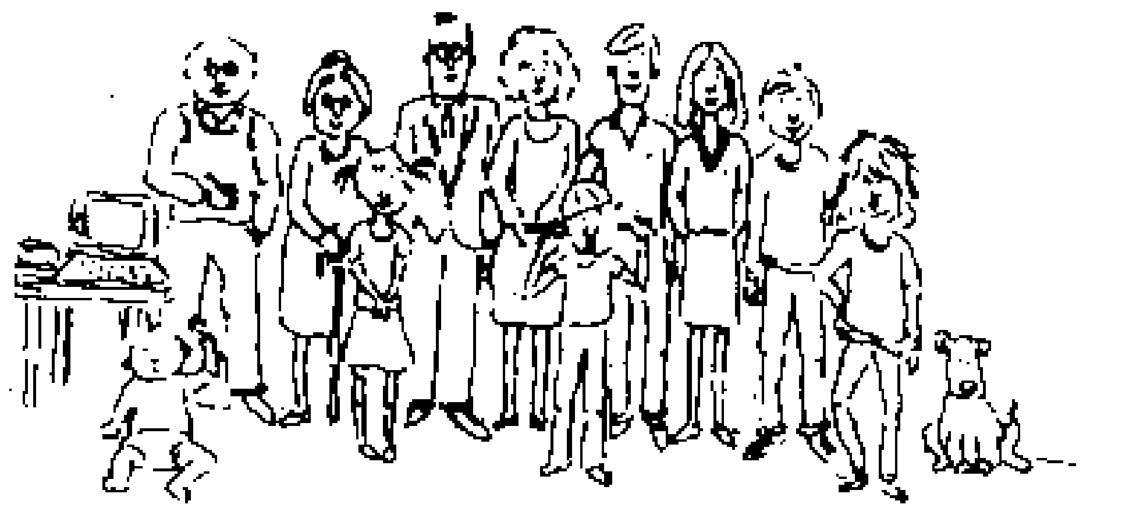
CALL FOR FREE EXPANSION BOX DETAILS

CALL FOR FREE TI SOFTWARE LIST!



The BACH Company

715 ENSIGN WAY, PALO ALTO, CA 94303



MICRO
COMPUTERS
CORPORATION

... a member of the family

34 Maple Avenue • Armonk, NY 10504
Telephone: (914) 273-6480

FREE NEWSLETTER & CATALOG

- THE FAMILY PROGRAMMER is a new newsletter for owners of TI home computers. It's filled with the latest news about TI hardware and software plus tips on computer maintenance and free programs to use and learn from.
- ALSO FREE: A complete catalog of TI products at low, low prices, including hundreds of programs for education & science, business & professional applications, games, music, utilities, languages and demos. Largest collection of educational software for the TI 99/4A ever assembled.

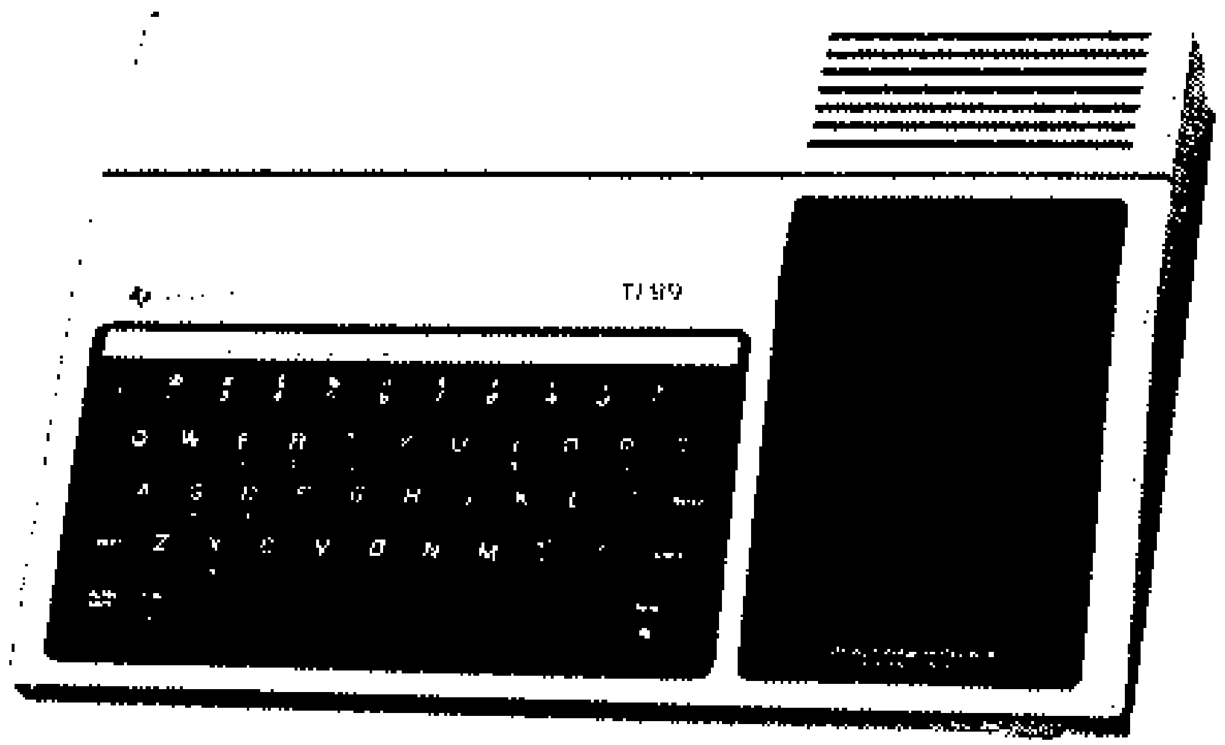
Don't miss this FREE offer. Put your name and address in an envelope and mail it today, or give us a call.

SAVE

SOUTHERN AUDIO VIDEO ELECTRONICS, INC.

Texas Instruments TI-99/4A Home Computer – $109.00*

*With TI manufacturer's rebate of $50.00.



PHA 4100 Color Monitor	$349.95
PHP 2400 TI Impact Printer	540.95
PHP 1100 Wired Remote Controllers	27.95
PHP 2700 Program Recorder	49.95

FREE EXPANSION BOX ($183. VALUE) with the purchase of any three of the following low price items:

PHP 1220 RS 232 Card	$135.95
PHP 1240 Disk Controller Card	189.95
PHP 1250 Expansion System Disk Drive	300.95
PHP 1260 Memory Expansion Card 32K	227.95
PHP 1270 P Code Card	189.95
PHM 3111 TI Writer	75.95
PHM 3113 Microsoft Multiplan	75.95

FREE SPEECH SYNTHESIZER when you buy six solid state software, command cartridges.

QUANTITIES ARE LIMITED!

We carry in stock all hardware and software for TI home computers.

PHM 3026 Extended Basic	$ 75.95
PHM 3035 Terminal Emulator II	38.95
PHM 3058 Mini Memory	75.95
PHM 3055 Editor/Assembler	37.95
PHM 3109 TI Logo II	74.95
PHM 3112 Parsec	30.95
PHM 3053 TI Invaders	44.95
PHM 3041 T Adventure (Pirate Adv.)	30.95
PHM 3057 Munch Man	30.95
PHM 3006 Home Financial Decisions	23.95
PHM 3044 Personal Report Generator	30.95
PHM 3002 Early Learning Fun	22.95
PHM 3090 97 Milliken Home Math Series K-8th grade	30.95
PHM 3059-62 Scholastic Spelling Level 3 6	41.95
PHM 3046 48 Scott, Foresman, Reading Pkgs.	41.95
PHM 3064 Touch Typing Tutor	30.95
PHM 7008 Speaking Scholastic Spelling	165.95
PHM 3122 Plato Interpreter	37.95
PHM 3083 88 Addison Wesley Computer Math Games I-VI	30.95

Get the best prices on TI hardware and software. For a complete listing of all SAVE's products, send $5.00 for our catalogue (refundable with your first order).

Enjoy the convenience of in-home shopping. Call our toll free number today for orders only.

Use your American Express, VISA, Mastercard, check or money order. Minimum order of $50. Outside continental U.S.A. minimum order $250. U.S. currency. Shipping and handling charges are extra. All prices are subject to change without notice. Allow 2-4 weeks for delivery. Prices good through September, 1983. *$50.00 Rebate expires January, 1984.

Order Toll Free 1-800-241-2682
In Georgia (404)-351-8459

99-8 **1782 Marietta Blvd., N.W., Atlanta, Georgia 30318**

THE PERFECT TEXAS INSTRUMENTS TRADEOFF.

Trade in your current Texas Instruments TI-99/4 Peripheral Accessories to the BACH Company and we'll give you credit towards the New TI Expansion Box and its peripherals.

Or, buy preowned, reconditioned TI-99/4 Peripheral Accessories at a Big savings from the BACH Company. Then, when you're ready, trade them in for credit towards the Expansion Box System of peripherals.

In either case, be sure to CALL TOLL FREE 800-227-8292. And in California call 415-969-6601 or 415-494-1995 for prices and more information about this exciting NEW TradeOff to improve your Texas Instruments Computer System.

THE BACH COMPANY
715 ENSIGN WAY, PALO ALTO, CALIFORNIA 94303

ATTENTION PROGRAMMERS!!

DATASOFT is currently seeking programs and programmers to add to their rapidly growing and expanding operation. A leading marketer and developer of personal computer software, DATASOFT offers experienced assembly-language programmers the opportunity to join their staff to develop and translate arcade games such as ZAXXON™, as well as to author original material for their games, education and home management product lines. DATASOFT pays competitive salaries, plus bonuses based on product performance. Relocation assistance is available, if needed.

If you have working knowledge of Atari, Apple, TI or Commodore operating systems, graphics, animation and sound, call or write our Product Development Department at:

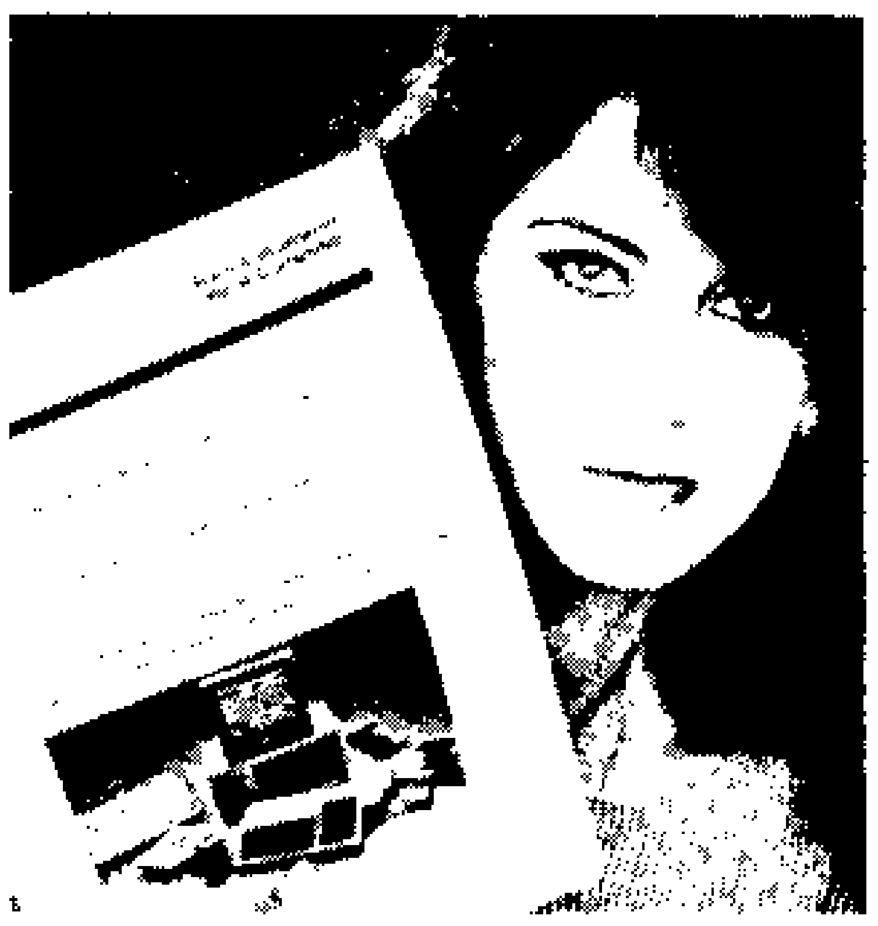
Datasoft Inc.®
COMPUTER SOFTWARE
9421 Winnetka Ave.
Chatsworth, CA 91311
(213) 701-5161 / (800) 423-5916

ZAXXON and SEGA are registered trademarks of Sega Enterprises. DATASOFT is a registered trademark of Datasoft, Inc.

TI HOME COMPUTER ENCYCLOPEDIA/CATALOG

from

UNISOURCE



Includes descriptions of hundreds of programs, peripherals and accessories for your TI Home Computer from TI, from 3rd party authors and from many other sources. Only $3 plus $1.50 postage. You'll find virtually everything you need for your Home Computer and you'll automatically get future updates. Order it today . . . from Unisource.

Toll Free 1-800-858-4580
(Ask for Operator 18)
(In Texas call 1-806-745-8834)

We accept Visa and MasterCard. For mail-in orders, send to P.O. Box 64240, Lubbock, TX 79464.

UNISOURCE ELECTRONICS, INC.

TI 99-4A USER'S GROUP
IMAGINE!!
5 USER PROGRAMS FOR ONLY $15.00

PURPOSE: To make available to owners of Texas Instruments Home Computers, a greater variety of software designed or translated by members at very low prices; a greater variety of hardware and software products manufactured by third parties and Texas Instruments at discount prices.

BENEFITS: The Membership provides:
1. User Software Catalog.
2. Discount Prices on ALL Texas Instruments Products.
3. Discounted Prices on Third Party Products that are compatible with the TI 99/4 and TI 99/4A.
4. New Product Announcements.
5. Special Sale Promotions.
6. Quarterly Newsletter.

HOW THE USER PROGRAM WORKS:

1. If you submit an original or translated program, you may choose any (5) User Programs from our current User Group Catalog in exchange for each original or translated program you submit. Your program will be returned to you on your choice of either Diskette or Cassette.

2. You say you're not a programmer! That's OK; you may purchase User Programs from our User Program Catalog for only $3.00 per program; however, there is a minimum requirement of (5) programs per order. This is to cover our cost of media, duplicating, shipping, cassettes, diskettes, and mailings.

(check one)
[ ] 6 Months $12
[ ] 12 Months $22
AMOUNT ENCLOSED $
[ ] CHECK
[ ] MONEY ORDER

SORRY—NO C.O.D.'s
AMERICAN EXPRESS
Card No.
Expiration Date:
5% WILL BE ADDED FOR USE OF CREDIT CARD SERVICE

MEMBERSHIPS FOR 12 Months may choose an additional (2) User Programs FREE at anytime during the 12 Months.

LUV-TR♥NICS USER GROUP
1111 Park Ave., Suite 303
Baltimore, Maryland 21201
(301) 523-5820

PLAY DATA/WARE'S FEATURED GAME: **Wyvern**

WYVERN:
('wī vərn) a two-legged dragon with wings and a barbed tail. Can you get the treasures without being fried? Look out for the web-spinning spider, the baby dragons, and especially the Wyverns. Multiple rooms, advancing levels of play.

MAD DOG:
You're driving a speeding red car down the highway when suddenly you begin to encounter giant, mutant spiders. Your mission: extermination. But watch out for the big, Mack truck. Timer, bonus bugs for extra points, advancing levels of play.

LOST PATROL:
Stranded deep in enemy territory, you must make your way back to your forces. Your 5 man patrol must avoid enemy men, treacherous terrain, and forces of nature. Pray that at least 1 man of your patrol can survive. Advancing rounds and difficulty.

BASEBALL TRIVIA:
Over 150 questions. Such as; "Who struck out Babe Ruth 19 out of 31 times?" Multiple choice. Each game is different because random numbers determine the possible selections and in which order the choices will be printed. Hours of fun.

MasterCard

CALL TOLL FREE

Mastercard & VISA Card Holders

VISA

☎ **1-800-382-3282**
1-800-882-3282 (CA only)

All orders shipped within 2 business days!
10% discount (2 or more games)

1-619-453-7660 (AK, HI, Canada)

Dealers' and Programmers' inquiries invited.

© All games Copyright 1983 DATA/WARE DEVELOPMENT, INC.

ORDER FORM
Extended BASIC Module Required

QTY.

☐ Wyvern (cassette) $14.95
☐ Mad Dog (cassette) $13.95
☐ Lost Patrol (cassette) $13.95
☐ Baseball Trivia (cassette) $ 8.95

QTY.

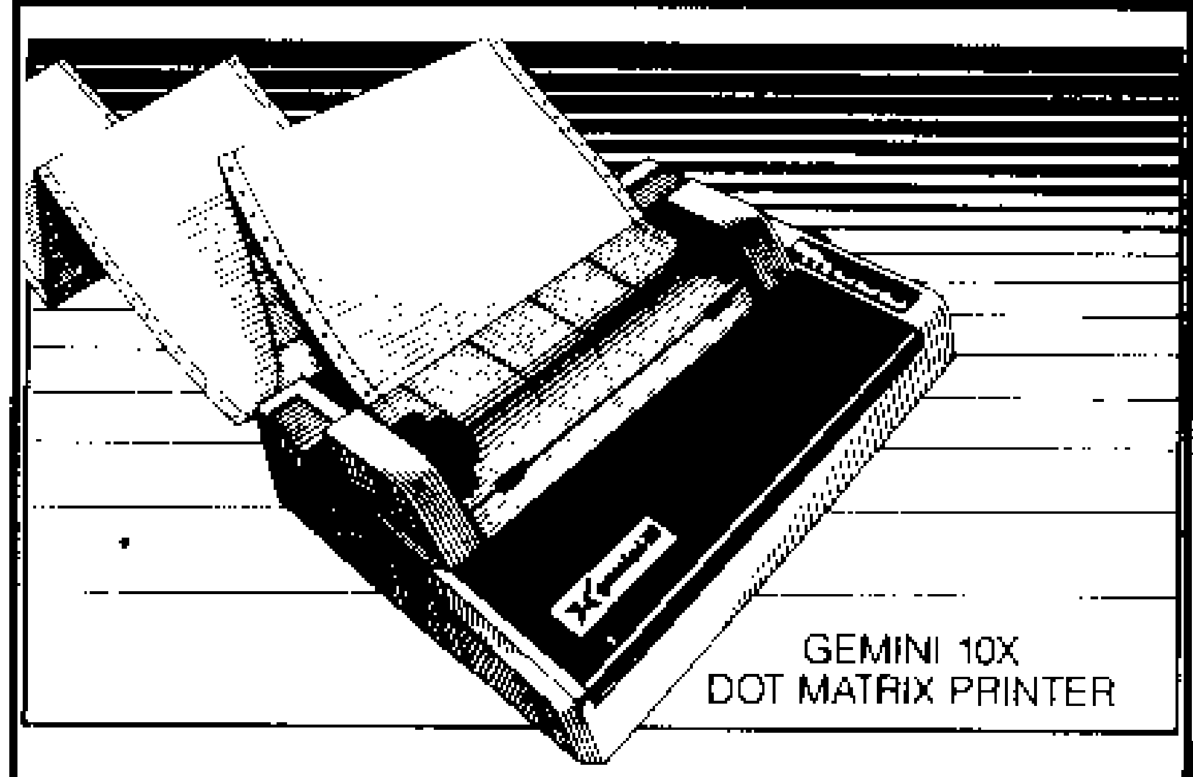
☐ Wyvern (disk) $16.95
☐ Mad Dog (disk) $15.95
☐ Lost Patrol (disk) $15.95
☐ Baseball Trivia (disk) $10.95

☐ Check ☐ Money Order ☐ MasterCard ☐ VISA
☐ Card No. ____________________ Exp. __________
Name ____________________ Signature ____________________
Street ____________________
City/State/Zip ____________________ Phone __________

Send this form or a copy with your check, moneyorder or credit card information to:
Data/Ware Development, Inc.
4204 Sorrento Valley Blvd.
San Diego, CA 92121
ATTN: Games

SUBTOTAL: __________
10% discount (2 or more items): (   )
CA res. sales tax: __________
Shipping & Handling: $2.25
TOTAL ENCLOSED: __________

SAVE AT ELEK-TEK ON TI-99/4A COMPATIBLES



GEMINI 10X $299.00

Gemini 15
Dot Matrix Printer [wide carriage] . . 399.00
Gem. 01 Ribbons for Gemini 10 or 15 ea. 3.50
above item per doz. 24.00
EPSON Printers . . . CALL
8750 Ribbon Cartridge for Epson Mx-80, Mx-80FT or TI-PHP2500 Printers 4.00
RS10A RS232 cable 25 pin fully loaded, 10 ft. 30.00
PA6T Parallel cable [designed for TI-99/4A 16 to 36 pin, 6 ft. 25.00
RS1Y Y cable designed for TI-99/4A allows combined use of printer and modem in serial port of RS232 . . . . 35.00

TANDON double sided disk drive (fits into peripheral expansion box) 230.00

WABASH DISKETTES
packed 10 to a library file storage box:
WAB-11 5¼" single side/single density diskettes . . . . [10] 20.00
WAB-12 5¼" single side/double density diskettes . . . . [10] 22.50
WAB-22 5¼" double side/double density diskettes . . . . [10] 30.00
FLIP N FILE 5¼" diskette storage box . . 20.00
Cassette/Module storage box 15.00
TDK D-60 blank 60 minute cassettes; . . . . [2 pack] 3.00
WICO 72-9714 Joystick 22.00
Y Adapter for above to fit TI-99/4A . . . 6.00
Avery 7030 10 M pressure sensitive labels [white]; 2 across on 8" wide tractor feed, fan-fold sheets 25.00
Avery 7031 15 M pressure sensitive labels [white]; 3 across on 11¾" wide tractor fee, fan-fold sheets 37.50
Wave Pad 1280 Noise and vibration reduction pad, 12" x 18" fits Epson and Gemini printers; brown 9.00
Wave Pad 1623 Noise and vibration reduction pad, 16" x 23" fits most letter quality printers; brown 12.00

Moonbeam Software Cassette or Disk
Astromania [ext. basic req.] 10.00
Cavern Quest [ext. basic req.] 10.00
Strike Force [ext. basix req.] 10.00
Death Drones 7.50
Moonvasion 7.50

Prices good while quantities last

CALL TOLL FREE 800-621-1269
EXCEPT Illinois, Alaska, Hawaii

Mastercard or Visa by mail or phone. Mail Cashier's Check, Money Ord., Pers. Check [2 wks to clr.] Add $4.00 1st item. **(AK, HI, P.R., Canada add $10.00 first item]** $1.00 ea. add'l shpg. & handl. Shipments to IL address add 6% tax. Prices subj. to change. **WRITE for free catalog. ALL ELEK-TEK MERCHANDISE IS BRAND NEW, FIRST QUALITY AND COMPLETE.**

ELEK-TEK, inc.
6557 N. Lincoln Ave., Chicago IL 60645
(800) 621-1269 (312) 677-7660

TI BASIC READY!!

At Gold Coast Avionics, all programs are written in BASIC **only** and require **no** extra equipment or command modules to run. . . .

*** INTRODUCTORY SPECIALS ***

* **Star Destroyer** . . . aliens are destroying the stars. Can you stop them? Laser action, random ships and challenge. Automatic high score feature.
Regular $9.95 **Special $7.95**

* **Submarine Search** . . . locate and sink the hidden submarines in the mine field with the help of sonar. Unlimited high score potential if you can survive!
Regular $12.95 **Special $9.95**

* **Sea Battle** . . . the classic board game of battleships for two players. Excellent graphics and sound add excitement to the action.
Regular $12.95 **Special $9.95**

* **Vocabulary Skills** . . . three programs in one with editing features allow this spelling program to grow with your child's skills.
Regular $14.95 **Special $11.95**

* **Arithmetic Skills** . . . addition, subtraction, and multiplication skills for grades 1 to 4. Easy editing to grow with your child's skills.
Regular $14.95 **Special $11.95**

- All programs on cassettes and 100% inspected.
- Full instructions included with all programs.
- Send check or money order. We pay postage and tax.

Gold Coast Avionics
908 Alamanda Drive
North Palm Beach, FL 33408

MICRONOVA presents the
HOME COMPUTER DIRECTORY

Put the world of your TI 99/4(A) at your fingertips with this unique information resource handbook!! The Directory contains hundreds of useful contacts and source material on. . . .

- ★ *Over 100 Software Businesses*
- ★ *TI Hotlines and contacts*
- ★ *Sources of technical information*
- ★ *Business and Market news*
- ★ *Future trends and new offerings*
- ★ *Computer Advantage Clubs*
- ★ *Publications* ★ *Logo & CAI contacts*
- ★ *Multilevel Marketing scene*
- ★ *Users Groups* ★ *Learning to program*
- ★ *On-line databases* ★ *And much more!*

Send $4.95 check or money order to:

MICRONOVA 99
P.O. Box 1058
Northampton, MA 01061

Cashflow . . . from p. 51

```
1070 NEXT B
1080 DISPLAY AT(10,1)ERASE ALL:"DO
     YOU WANT TO RESERVE AN": :"EQU
     AL AMOUNT EACH MONTH": :"TOWAR
     D THIS BILL? (Y/N)   Y"
1090 ACCEPT AT(14,26)SIZE(-1)VALIDA
     TE("YN")BEEP:A$ :: IF A$="N" T
     HEN 1130
1100 FOR B=1 TO 12 :: AK(A,B)=0 ::
     NEXT B
1110 FOR B=1 TO PT :: M=MO(A,B):: A
     K(A,M)=AK(A,M)+X(A,B):: FOR C=
     1 TO 11 :: M=M+1 :: IF M=13 TH
     EN M=1
1120 AK(A,M)=AK(A,M)+X(A,B)/12*C ::
      NEXT C :: NEXT B :: GOTO 1150
1130 DISPLAY AT(2,1)ERASE ALL:"FOR
     EACH MONTH, ENTER THE": :"AMOU
     NT YOU WISH TO HAVE": :"ACCUMU
     LATED TOWARD THIS": :"ITEM:"
1140 FOR M=1 TO 12 :: DISPLAY AT(M+
     9,3):M$(M);TAB(15);"$" :: ACCE
     PT AT(M+9,16)SIZE(6)VALIDATE(D
     IGIT,".")BEEP:AK(A,M):: NEXT M
1150 NEXT A :: IF A=17 THEN A=16 ::
      DISPLAY AT(12,10)ERASE ALL:"F
     ILES FILLED" :: FOR C=1 TO 400
      :: NEXT C :: RETURN
1160 DISPLAY AT(7,1)ERASE ALL:"ENTE
     R THE NUMBER": :"OF THE PRESEN
     T": :"MONTH (1-12):";TAB(21);"
     1"
1170 ACCEPT AT(11,21)SIZE(-2)VALIDA
     TE(DIGIT)BEEP:PM :: IF PM<1 OR
      PM>12 THEN 1160
1180 DISPLAY AT(15,1):"ENTER THE AM
     OUNT": :"YOU HAVE ALREADY": :"
     SAVED, IF ANY:";TAB(20);"$0"
1190 ACCEPT AT(19,21)SIZE(-7)VALIDA
     TE(DIGIT,".")BEEP:SA(PM):: IF
     SA(PM)<0 THEN 1180
1200 SAV=SA(PM):: RETURN
1210 ! TOTAL ACCOUNTS
1220 FOR M=1 TO 12 :: T(M),EX(M),NP
     (M)=0 :: FOR I=1 TO A :: T(M)=
     T(M)+AK(I,M)
1230 FOR PT=1 TO 4 :: IF MO(I,PT)=M
      THEN NP(M)=NP(M)+1 :: EX(M)=E
     X(M)+X(I,PT)
1240 NEXT PT :: NEXT I :: NEXT M
1250 M=PM-1 :: FOR B=1 TO 12 :: M=M
     +1 :: IF M=13 THEN M=1
1260 P(M)=T(M)-SA(M)-EX(M)
1270 IF B=12 THEN 1280 ELSE IF M<>1
     2 THEN SA(M+1)=SA(M)+P(M)ELSE
     SA(1)=SA(12)+P(12)
1280 NEXT B
1290 DEL=0 :: FOR I=1 TO A :: IF I$
     (I)="" THEN DEL=DEL+1
1300 NEXT I
1310 ! PRINT DATA FILE
1320 PRINT #1,REC 0:A-DEL,:: FOR I=
     1 TO A :: IF I$(I)<>"" THEN PR
     INT #1:I$(I),
1330 NEXT I
1340 M=1 :: FOR R=1 TO 23 STEP 2 ::
      RESTORE #1,REC R :: FOR I=1 T
     O A :: IF I$(I)<>"" THEN PRINT
      #1:RD(AK(I,M)),
1350 NEXT I
1360 PRINT #1:RD(T(M)),RD(SA(M)),RD
     (EX(M)),RD(P(M)),NP(M)
1370 DEL=0 :: FOR I=1 TO A :: IF I$
     (I)="" THEN DEL=DEL+1 :: GOTO
     1400
1380 FOR PT=1 TO 4 :: IF M=MO(I,PT)
     THEN PRINT #1:I-DEL,X(I,PT),!
     MAXIMUM OF 14 PAYMENTS IN ONE
     MONTH
1390 NEXT PT
1400 NEXT I :: M=M+1 :: NEXT R
1410 R=25 :: C=0 :: RESTORE #1,REC
     R :: FOR I=1 TO A :: IF I$(I)=
     "" THEN 1440
1420 FOR PT=1 TO 4 :: PRINT #1:MO(I
     ,PT),X(I,PT),:: NEXT PT
1430 C=C+1 :: IF C=3 THEN C=0 :: R=
     R+1 :: RESTORE #1,REC R
1440 NEXT I
1450 PRINT #1:PM,SAV
1460 RETURN
1470 ! INPUT RECORDS TO ALTER
1480 INPUT #1,REC 0:A,
1490 FOR I=1 TO A :: INPUT #1:I$(I)
     ,:: NEXT I :: RETURN
1500 M=1 :: FOR R=1 TO 23 STEP 2 ::
      RESTORE #1,REC R :: FOR I=1 T
     O A :: INPUT #1:AK(I,M),:: NEX
     T I :: M=M+1 :: NEXT R
1510 R=25 :: C=0 :: RESTORE #1,REC
     R :: FOR I=1 TO A
1520 FOR PT=1 TO 4 :: INPUT #1:MO(I
     ,PT),X(I,PT),:: NEXT PT :: C=C
     +1 :: IF C=3 THEN C=0 :: R=R+1
      :: RESTORE #1,REC R
1530 NEXT I
1540 INPUT #1:PM,SAV
1550 RETURN
1560 ! DISPLAY ITEMS
1570 DISPLAY AT(12,10)ERASE ALL:"WO
     RKING..." :: RETURN
1580 C=5 :: CALL CLEAR :: FOR B=1 T
     O A+1 :: DISPLAY AT(B+2,1):STR
     $(B);"." :: NEXT B
1590 FOR I=1 TO A :: DISPLAY AT(I+2
     ,C):I$(I):: NEXT I :: RETURN
1600 DISPLAY AT(I+2,5):"*PRESENT MO
     NTH/SAVINGS" :: RETURN
1610 END
```

99'er

TEXAS
SOFTWARE DESIGN

We specialize in BASIC/Extended BASIC cassette programs for the 99/4A Computer.

EXPERIENCE THE FUN
AND EXCITEMENT OF:
STRATEGY AND ACTION GAMES
PUZZLING TEXT ADVENTURES
GRAPHIC & SOUND ENTERTAINMENT

For a free program catalog, send a self-addressed stamped envelope to:

TEXAS SOFTWARE DESIGN
4000 Tompkins Drive
Baytown, Texas 77521

JUNGLE MAN
You are the JUNGLE KING!! You must—swing on vines, swim mighty rivers, jump over rolling boulders, and save Jane from the hungry cannibals.
EXT. BAS. cass............$14.49

Qube*Bert
Help Qube*Bert jump from cube to cube. But, be careful not to jump into NERD, SLIMY, ROLLO or MR. OGG. Arcade action.
EXT.BAS cass.............$14.49

Special!!
Both games for $24.95
send orders to:

Arcade Design
P. O. Box 8233
Red Bank, N.J. 07701
Ask for the Arcade Game list.
Many games sold under $10!!

Persuasion . . . from p. 13

Hence the black outline. It shuts off the electron beam and assists the eye, making the bars appear sharper. Because the bars are the main part of the graph, a third consideration is involved: Outlining makes them stand out.

Putting outlines around bars with TI BASIC is difficult because only two colors are allowed within a character block. For instance, if the screen is blue and the bar is to be red and have a black outline around it, many bar heights cannot be defined because they would require blue, red, and black in the character block used for the top of the bar. The program gets around this problem by having a rather wide black band across the top of each bar in conjunction with the use of two characters at the bar top. This black band is distributed between the two characters so that only two colors are needed in either character. The topmost character (I call it a *barcap* in the program) has the colors black and the screen color. The character just below has the colors black and the bar color (it is called *a barhead* in the program). How much of the black band is

Continued on p. 62

TABLE 1. PROGRAM MODIFICATION EXAMPLES

TO CHANGE:	IN LINE NUMBER: INSERT:
Title	290 TITLELINE1$ = "CITY OF" 300 TITLELINE2$ = "PECAN GAP"
Title to one line	290 TITLELINE1$ = "CORN YIELD" 300 TITLELINE2$ = " "
Location of title box	310 RO = 3 320 CL = 15 NOTE: Will start title at row three, column fifteen. Upper left corner of title box will be at row two, column fourteen.
Labels	330 LABEL$ = "PLOT NUMBER" 340 ROW = 23 350 COLMN = 17 360 GOSUB 2480 . . . 640 GOSUB 2480 NOTE: GOSUB 2430 prints vertical labels and GOSUB 2480 prints horizontal labels.
The data	670 DATA 32,15,14,7,106,60,39,18 NOTE: Bar number one will be plotted 32 units high and 15 could be printed on the bar. Bar number two will be plotted fourteen units high and 7 could be printed with that bar, etc. Data should be coordinated with the scale on line 720
Tick marks	770 DATA 91,0038003800380038, 92,00380038003800FE,93,003800FF00380038 NOTE: Many other possiblities exist. Tick marks need to be coordinated with grid lines.
Scale numbering to 0,2,4,6,8.	730 SCALE$ = " 8 6 4 2 0" NOTE: Will be printed vertically.
Vertical axis label.	740 VERTICAL1$="POWER" 750 VERTICAL2$ = "JOULES/SEC" NOTE: To print a label vertically use: 2040 GOSUB 2430 2080 GOSUB 2430
The "%" label on the bars to A,B,C,D.	191 DIM LETTERS$(4) 192 LETTERS (1) = "A" 193 LETTERS (2) = "B" 194 LETTERS (3) = "C" 195 LETTERS (4) = "D" 1900 LABEL$ = LETTERS$(BAR)
Bar spacing to one column.	1330 CLMN = 4*BAR
1st bar location to column 14	1330 CLMN = 4*BAR - 11
The number of bars to three.	1320 FOR BAR = 1 TO 3
Grid line spacing	1030 FOR ROW520 to 1 STEP - N (where N = 1,2, or 5) NOTE: Other possibilities exist.
To remove my name from your graph.	Delete lines 1130 and 1140.
The colors of the bars.	680 BARCOLOR1 = *numbers from* 690 BARCOLOR2 = *1 to 16* 700 BARCOLOR3 = *representing* 710 BARCOLOR4 = *colors*
Move the vertical axis to column 10	1010 COL = 10

PROMETHEUS
SOFTWARE

We Have The Finest
Quality Software
Available For The
TI99/4
Home Computer

Strategy Games
- CHECKERS
- REVERSI
- CRIBBAGE
- WARI
- GO-MOKU
- BLACKJACK PROFESSOR

Action Games
- WAR OF THE WORMS
- ASTEROID MINER
- FROGLEGS
- HELICOPTER ATTACK

Send today for a
FREE CATALOG
of all our programs!

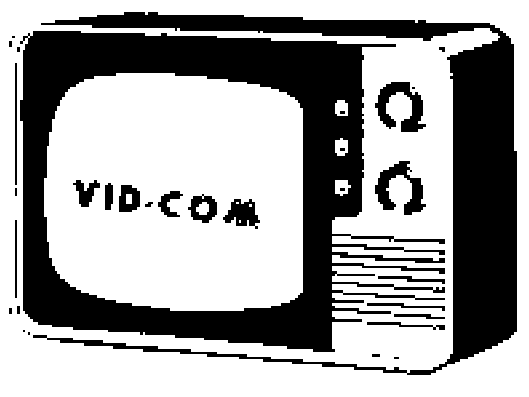
Dealer Inquiries
Invited

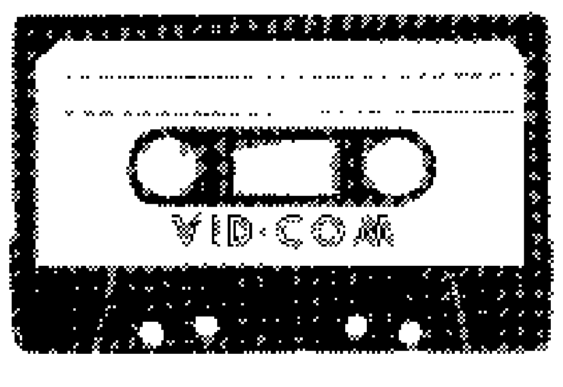
* * * * * * * *

WANTED
Innovative Software
in the following
categories:
- ENTERTAINMENT
- BUSINESS APPLICATIONS
- UTILITIES
- EDUCATION

Let Prometheus Software take over the headaches of publishing your software. We are looking for quality programs in basic, pascal, or 9900 assembly code. Just send us a complete description of the software package. Our royalties are very competitive.

PROMETHEUS
SOFTWARE
413 Lowell Ln.
Richardson, TX 75080





VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM

VID-COM™ 1018 E. Philadelphia Street, York, PA 17403
(Mail Order Only)

X BASIC DISK UTILITY 4.0 BASIC DISK UTILITY 2.0 Full documentation included. Disk Only Order #202D Disk Both Programs Only $24.95
These programs will catalog your disks and provide: diskname, available and used sectors, filename, length, type and protection information. In addition, version 4.0 will run itself and any X-basic program with the touch of a key

SPEAK & FILE Basic, T E II, and Speech Synthesizer required Full documentation included. Order #205D Disk #205C Cassette $14.95
What will your computer say next? Your computer can say any word you can type in on the keyboard! This program will allow speech with control of pitch, slope primary and secondary stress, and delay utilizing the T E II module protocols. In addition, you can create custom files that can be saved, recalled at your instruction, and also be used with your basic programs.

DARK AGES A text adventure game. Basic **Order #209D Disk #209C Cassette $14.95**
You are a warrior in a time when your best weapon is not a sword, but your mind. In a dark dismal corner of the earth there lies a kingdom now ruled by an evil emperor. The emperor has filled his castle with the most horrendous creatures he could pull from the dark recesses of his mind. No one has tried to stop him, until now.... Your task is to find the legendary scepter and rescue the princess so she may rightfully regain the throne. Trust no one, for the emperor's creatures will seek to deceive you. If your courage fails you, the answers lie in a sealed envelope supplied with the program.

GHOST WRITER Basic Order #207D Disk #207C Cassette $14.95
Just supply ghost writer with a few choice words and away it goes. Four totally different stories will be created and the results can be amazingly funny. The same words can be used again and again, while ghost writer changes each and every story, if you desire. You can save any story for future use. The only option required is a sense of humor.

X-BASIC DIRECTORY 4.0 Full documentation included. Order #203D Disk #203C Cassette $14.95
This easy to use program will allow you to build custom phone directories. By including simple additional circuitry, it can auto-dial (tones) any number with the touch of a key. Some of the features include: Auto-dial on-off, full editing (by index or entry), call log with timer, redial, date and a separate area for access codes.

INFORMATION BULLETIN Order #IB-1 $9.95
This is one in a series of information bulletins designed to help you get the most out of your computer and accessories. Now you can swap programs and files over standard radio and telephone circuits without the use of RS232, modems, expansion, etc. If that isn't enough, it works faster than the 300 baud program exchange, requires no modifications to your computer, and can be done with inexpensive off the shelf items. Now how can you resist?

Why risk your expensive and important data on cheap audio cassettes? VID-COM computer cassettes are specifically designed for computer use. These C-10 cassettes use the finest materials available, and feature a special short leader for strength and proper record positioning. Each tape includes a protective box and label.
VID-COM computer cassettes are made in USA and 100% guaranteed for life against defects in material and workmanship.
Box of 12 Tapes........ Order #CC-10 $11.95
with individual protective boxes and labels included **Quantity discounts available, write for prices**

VID-COM makes the parallel to parallel connection. Now at last utilize the high speed parallel port on the RS232 expansion card. It will dump to the printer almost three times faster than the 9600 baud serial port. Why tie up your serial port and pay extra for a serial equipped printer?
Introducing the new GX-100 Graphic Printer, featuring: adjustable tractor feed, 80 columns, software control, double width characters, position addressing, and much more!

MODEL		INTERFACE	PRICE	ORDER #
GX-100	NEW	10" Parallel	$ 199.95	#GX-100P
PROWRITER 8510 AP		10" Parallel	$ 379.95	#8510P
PROWRITER 2 1550		15" Parallel	$ 649.95	#1550P
PROWRITER 8510 BCD		10" Serial	$ 539.95	#8510S
PROWRITER 2 1550		15" Serial	$ 699.95	#1550S
STARWRITER F10-40		Serial or Parallel (specify)	$1099.00	#F10-40(S) or (P)
PRINTMASTER F10-55		Serial or Parallel (specify)	$1519.00	#F10-55(S) or (P)
CABLE		Serial or Parallel (specify)	$ 29.95, $34.95 Shielded	#PC-(S) or (P)

VID-COM NOW CARRIES ANSI APPROVED 5¼" ELEPHANT DISKETTES. ALL OUR PROGRAMS ON DISK UTILIZE THIS FINE PRODUCT.
#D-1 SINGLE SIDE, SINGLE DENSITY, SOFT SECTOR........ BOX OF 10 DISKS $19.95 A BOX - CASE OF 10 BOXES $18.95 A BOX - BULK PACK OF 120 DISKS $219.00
#D-2 DOUBLE SIDED, DOUBLE DENSITY SOFT SECTOR........ BOX OF 10 DISKS $28.95 A BOX - CASE OF 10 BOXES $27.95 A BOX - BULK PACK OF 120 DISKS $329.00

5¼" PROFESSIONAL HEAD CLEANING KIT Contents include liquid cleaner and 2 cleaning disks. Order #FD-05 $27.95 5¼" FLOPPY LIBRARY BOX Order #LB-105 $3.95

PROGRAMMERS AND USERS. Do you have a good program or idea? Don't waste it! Send it to VID-COM. VID-COM hereby agrees to non-disclosure of your idea or program. Let's make $$$ together!
DISTRIBUTORS: Are you interested in any specific VID-COM programs, subprograms, or ideas? Write for our sublicense agreement. Exclusive and non-exclusive agreements available. Send $10.00 (refundable) for information

ALL PROGRAMS, DATA AND INFORMATION © 1983 VID-COM SEND FOR CATALOG $2.00 (REFUNDABLE WITH PURCHASE)
TERMS: Add 3% shipping and handling ($3.00) minimum. Free shipping and handling on software orders over $50.00. PA residents add 6% sales tax. For the quickest service send money order or cashiers check. Personal checks may take 14 days to process. DO NOT SEND CASH. Prices, availability and quantity subject to change without notice.
VID-COM will attempt to notify purchaser if changes occur pertaining to their order after placement of this ad. No C.O.D., credit cards or calls accepted. Help us keep your prices low

REMEMBER.

ELEPHANT
MEMORY SYSTEMS

"NEVER FORGETS"

VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM VID-COM

At last! Software for
16K TI BASIC
No special hardware required.

TIZZY

A challenging game based on the formation of words containing the letters 'TI'. On the flipside is 'Hangman' with 6 skill levels. Both games ideal for drilling in typing, spelling, and vocabulary Fun for ages 9 and up........ **$10.50**

KWIZKID

Two multiple-choice quizes, over 100 questions, on American and world history and geography. Education and fun in one package, for ages 9 and up. Also you can add your own questions!........ **$10.50**

DIYAD

Unique DIY adventure game. Invent adventures for yourself and others. Store as many as you want on tape. Optional randomization fills even your own inventions with surprise and challenge! Includes adventure compiling program, playing program, plus desert island adventure to get you started. DIYAD is limited only by your own imagination!........ **$16.50**

TOAD GRAPHICS

LOGO too expensive! TOAD GRAPHICS has many of the features of turtle graphics at a fraction of the price, and no extra hardware cost. Toad moves about the screen drawing pictures with tiles. Recursive procedures, loops, conditions, etc. An immediately appealing way to learn programming concepts. **$14.50**

TIMON ETC.

Two music programs. On one side a version of 'SIMON' for your TI. On the other, a program which transposes input tunes into any major or minor key **$8.50**

Prices in US funds. Please add $1.50 per order for p&p to US and Canada. Other countries on application. Discount 10% on orders over $30. Checks or money orders to:

WELCOM SOFTWARE
9219 Katy Freeway, Suite 175B
Houston, TX 77024
All programs on cassette for 16K TI BASIC with full documentation.

Counting Fun . . . from p. 34

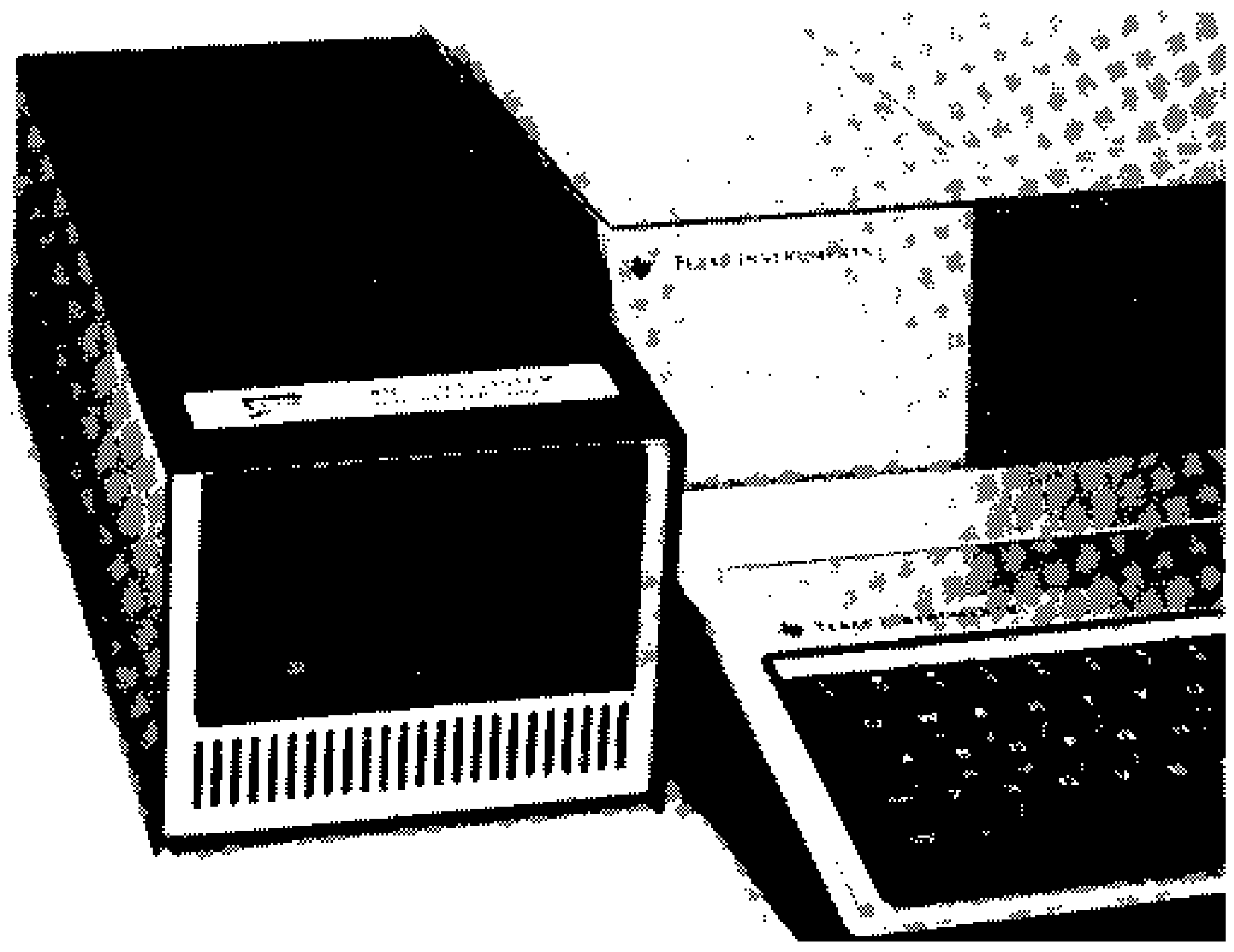
```
410 CALL CHAR(152,"7EFFFFE7E7FFFFF
F")
420 CALL CHAR(153,A$)
430 CALL CHAR(154,"FFFFFFFF7F3F0F0
1")
440 CALL CHAR(155,"FFFFFFFFFEFCF8F
0")
450 CALL CHAR(156,"0103070F1F3F7FF
F")
460 CALL CHAR(157,"80C0E0F0F8FCFEF
F")
470 CALL CHAR(142,"FFFFFFFF")
480 CALL CHAR(143,"0101010101010101F
F")
490 CALL CHAR(104,"8080D1537373333
1")
500 CALL CHAR(105,"0078FEFF9393FFF
E")
510 CALL CHAR(106,"303030303030303
0")
520 CALL CHAR(107,"303031F0F03030
3")
530 CALL CHAR(108,"30FCFFFFFFFFFFF
F")
540 CALL CHAR(109,"030303030311F3
F")
550 CALL CHAR(110,"FFFFFFFFFFFECFC
F")
560 CALL CHAR(111,"00000000000000E0F
0")
570 CALL CHAR(118,"C3E7FF7E7E3C3C1
8")
580 CALL CHAR(141,"0000003F35FFFF2
2")
590 CALL CHAR(159,"0060E17E7E3E081
8")
600 CALL CHAR(119,"9C9C8888FE3E3E1
4")
610 RANDOMIZE
620 F=0
630 X=0
640 Y=0
650 Z=0
660 R=10
670 CALL CLEAR
680 FOR L=1 TO 2
690 C=2
700 A=INT(4*RND)+1
710 B=INT(6*RND)
720 FOR N=1 TO B
730 IF A=1 THEN 790
740 IF A=2 THEN 820
750 IF A=3 THEN 850
760 F=F+1
770 GOSUB 1850
780 GOTO 870
790 X=X+1
800 GOSUB 1530
810 GOTO 870
820 Y=Y+1
830 GOSUB 1630
840 GOTO 870
850 Z=Z+1
860 GOSUB 1730
870 C=C+5
880 NEXT N
890 R=R+6
900 NEXT L
910 PRINT "HOW MANY          ? "
920 CALL HCHAR(23,16,118)
930 CALL HCHAR(23,12,118)
940 CALL HCHAR(23,14,118)
950 INPUT G
960 IF G=X THEN 1010
970 W=W+1
980 GOSUB 2010
990 PRINT "NO...";X
1000 GOTO 1030
1010 F=F+1
1020 GOSUB 1960
1030 PRINT "HOW MANY          ? "
1040 CALL HCHAR(23,16,141)
1050 CALL HCHAR(23,12,141)
1060 CALL HCHAR(23,14,141)
1070 INPUT H
1080 IF H=Y THEN 1130
1090 W=W+1
1100 GOSUB 2010
1110 PRINT "NO...";Y
1120 GOTO 1150
1130 F=F+1
1140 GOSUB 1960
```

RELIABLE MASS STORAGE FOR THE TI99/4?

YOU BET!!

Field tested, MYARC's Winchester Disk and Controller System, the WDS/100 is custom engineered for reliability, ease of use and total upward compatibility from your floppy disk system. UNIX*-like file management is built into its Disk Operating System to accommodate the simplest to the most complex file processing requirements. Start up diagnostics, state-of-the-art error correction coding and rigorous factory burn-in ensure data integrity and hardware reliability. Sealed disk drive eliminates costly preventative maintenance. TURN YOUR 99/4 INTO A TRUE DATA STORAGE SYSTEM!

*UNIX is a trademark of Bell Laboratories.



MYARC's Winchester Disk For The 99/4
$2599 — 5-Megabyte Model
$2999 — 10-Megabyte Model
CLOCK OPTION AVAILABLE

AVAILABLE **NOW**

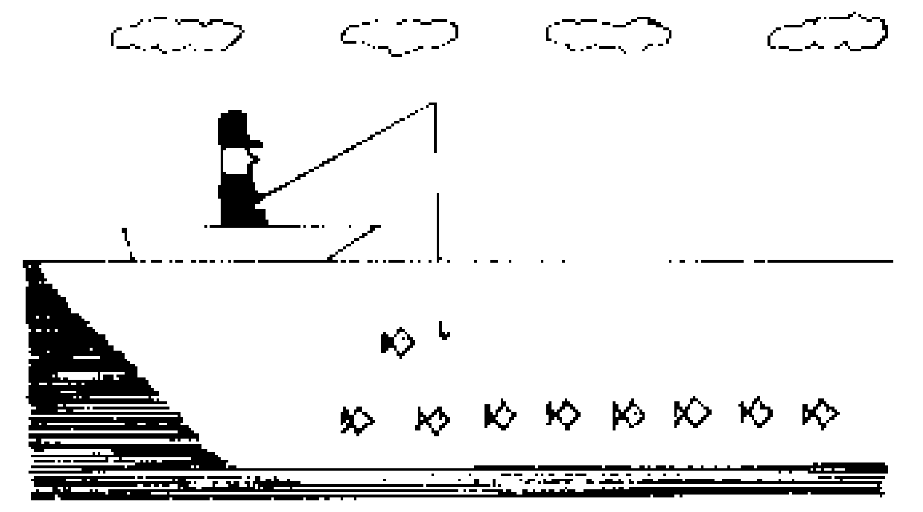
MYARC, INC.
P.O. Box 140
Basking Ridge, N.J. 07920
(201) 766-1700

Counting Fun

```
1150 PRINT "HOW MANY           ? "
1160 CALL HCHAR(23,16,159)
1170 CALL HCHAR(23,12,159)
1180 CALL HCHAR(23,14,159)
1190 INPUT I
1200 IF I=Z THEN 1250
1210 W=W+1
1220 GOSUB 2010
1230 PRINT "NO...";Z
1240 GOTO 1270
1250 F=F+1
1260 GOSUB 1960
1270 PRINT "HOW MANY           ? "
1280 CALL HCHAR(23,16,119)
1290 CALL HCHAR(23,12,119)
1300 CALL HCHAR(23,14,119)
1310 INPUT J
1320 IF J=P THEN 1370
1330 W=W+1
1340 GOSUB 2010
1350 PRINT "NO...";P
1360 GOTO 1390
1370 F=F+1
1380 GOSUB 1960
1390 INPUT "HOW MANY OF ALL OF THEM
? ":O
1400 V=X+Y+Z+P
1410 IF O=V THEN 1460
1420 GOSUB 2010
1430 PRINT "NO...";V
1440 W=W+1
1450 GOTO 1480
1460 F=F+1
1470 GOSUB 1960
1480 PRINT "YOU HAVE GOTTEN ";F;" R
IGHT"
1490 PRINT "YOU MISSED ";W
1500 PRINT "I LOVE YOU, ";K$
1510 INPUT U$
1520 GOTO 610
1530 REM  HEART
1540 CALL HCHAR(R,C+2,128)
1550 CALL HCHAR(R,C+3,129)
1560 CALL HCHAR(R,C+4,130)
1570 CALL HCHAR(R+1,C+2,131)
1580 CALL HCHAR(R+1,C+3,132)
1590 CALL HCHAR(R+2,C+2,133)
1600 CALL HCHAR(R+2,C+3,134)
1610 CALL SOUND(500,-1,2)
1620 RETURN
1630 REM  BUS
1640 CALL HCHAR(R,C+1,136)
1650 CALL HCHAR(R,C+2,137,3)
1660 CALL HCHAR(R+1,C,139)
1670 CALL HCHAR(R+1,C+1,138,4)
1680 CALL HCHAR(R+2,C+1,144)
1690 CALL HCHAR(R+2,C+3,144)
1700 CALL SOUND(200,-2,2)
1710 CALL SOUND(300,-2,2)
1720 RETURN
1730 REM  DUCK
1740 CALL HCHAR(R,C+2,152)
1750 CALL HCHAR(R+1,C+2,153)
1760 CALL HCHAR(R+2,C+3,153)
1770 CALL HCHAR(R+2,C+2,154)
1780 CALL HCHAR(R+2,C+4,155)
1790 CALL HCHAR(R+1,C+4,156)
1800 CALL HCHAR(R+1,C+3,157)
1810 CALL HCHAR(R+1,C+1,142)
1820 CALL HCHAR(R+3,C+3,143)
1830 CALL SOUND(800,-3,2)
1840 RETURN
1850 REM  ET
1860 CALL HCHAR(R,C+2,104)
1870 CALL HCHAR(R,C+3,105)
1880 CALL HCHAR(R+1,C+2,106,2)
1890 CALL HCHAR(R+2,C+2,107)
1900 CALL HCHAR(R+2,C+3,108)
1910 CALL HCHAR(R+3,C+2,109)
1920 CALL HCHAR(R+3,C+3,110)
1930 CALL HCHAR(R+3,C+4,111)
1940 CALL SOUND(700,-4,2)
1950 RETURN
1960 REM  RIGHT SOUND
1970 CALL SOUND(200,880,8)
1980 CALL SOUND(200,988,9)
1990 CALL SOUND(300,1047,0)
2000 RETURN
2010 REM  WRONG SOUND
2020 CALL SOUND(500,-7,8)
2030 RETURN
```

OPEN THE DOOR
FOR SPECIAL LEARNERS

Software Programs Designed and Field Tested by a Rehabilitation Expert.



FUN PROGRAMS THAT START WITH THE BASICS

- COUNTING
- ARITHMETIC
- SPELLING
- WORD RECOGNITION

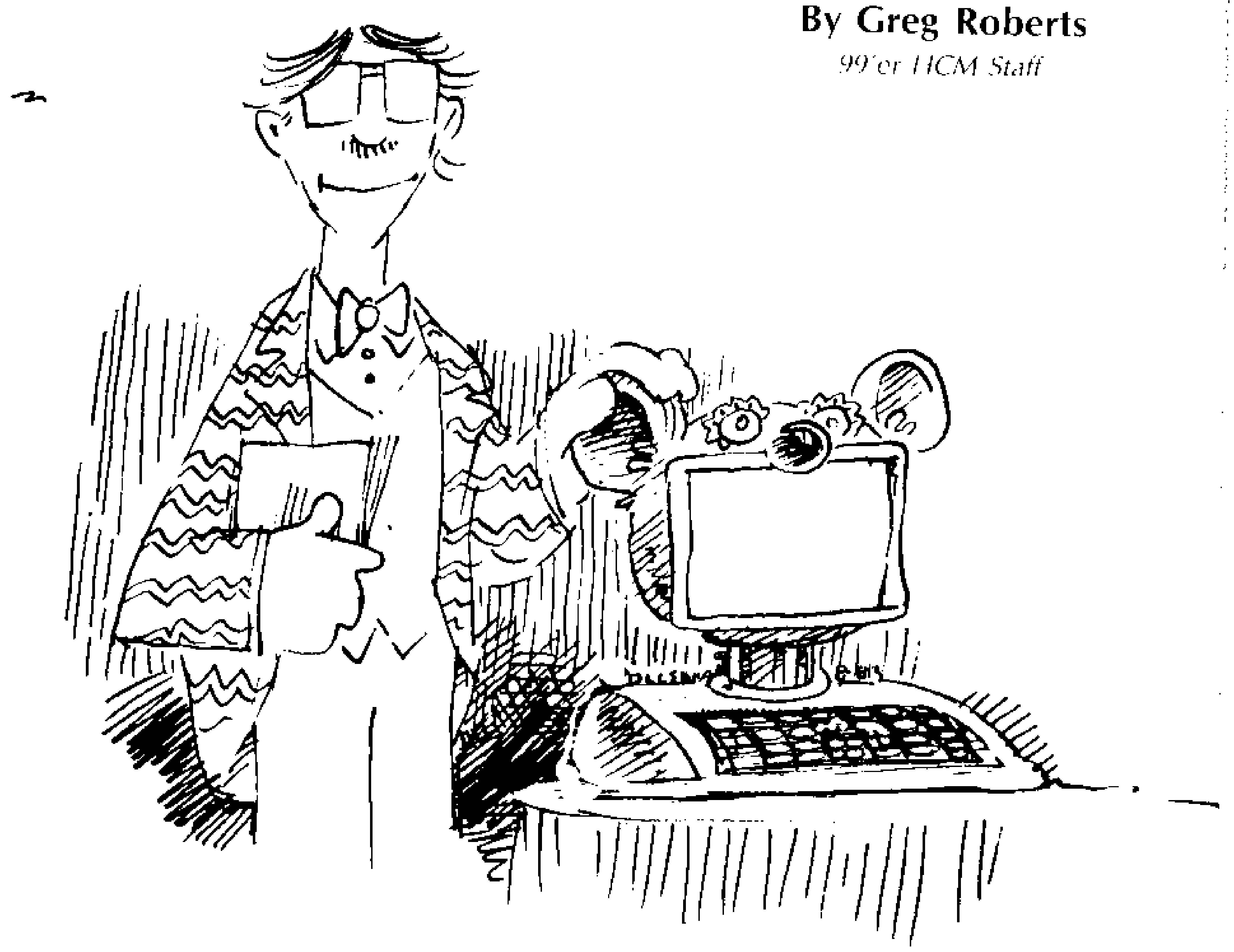
A hands on experience designed especially for slow learners, encouraging family involvement.

FREE BROCHURE AVAILABLE
WRITE OR CALL:

THE UPPER ROOM
907 6th Avenue East
Menomonie, WI 54751
715-235-5775

Mean Machines and Small Potatoes

By Greg Roberts
99'er HCM Staff



Choosing the right-sized computer is not as bewildering as it was just a few years ago. There are now enough salespeople (trained ones, not just refugees from the real estate crash) to give good advice, and give it free. And yet the consultants' files (and their bank accounts) are still getting fat from clients who get into a terrible mess—simply because they pay less attention to choosing the right-sized computer than they do to getting their exact choice in a pizza.

Many computer enthusiasts have done well with the "small is beautiful" trend for home use, and even for businesses of Kool-Aid stand status. But sometimes a small beautiful thing can turn on you like a baby coral snake—leading to irreversible nerve damage.

In the case of the Pay 'N' Throw discount stores, someone in middle management decided that the store in Backwater, Washington could be handled by the Trymex Unclear computers—a few in each department, a small swarm in all.

Dick Dren, an MBA fresh out of Tupelo Business College and Skin Diving School, had surfaced in Backwater last winter and immediately came on board at Pay 'N' Throw as their systems manager. When Dren hit upon the Trymex Unclear plan, he confidently walked into the office of store manager Herb Winemouth and boldly stated, "I think we should. . .

"Go for it!" said Winemouth, slamming his bottom desk drawer and wiping his chin. That week the computers were configured, the interfaces implemented, the documentation deciphered, the hardware handshooked, and the employees enabled.

The computers went straight to their main task: inventory. One department—Pets—actually managed all right with the new machine. There the inventory was low because of certain trends in society, e.g., there was a preference for robot dogs because they didn't get rabies and didn't shed on the lawn. (Robot breeds were in the hardware department.) And sales of tropical fish were gasping too. After all, who would want to maintain an aquarium when you could program a whole screenful of neon tetras in Extended BASIC? And if you got tired of a video fish, you could always delete it without the guilt that comes with pulling the handle on the toilet.

Such being the case, the pet people were able to cram most of their data into the little black box, but other departments were not so successful. When the pharmacy logged in its Tylenol substitutes, the machine's memory swelled to capacity and caused all sorts of headaches. Unable to make the machine snap out of its narcosis, one of the pharmacists looked for solutions in—of all things—a printer manual, and ended up soaking the computer in Epsom salts.

In the store cafeteria the computer got a health inspector's welcome. The cooks just let it sputter and fry.

"But you're supposed to be using it to keep track of your recipes," Dren told them.

"Everything we need is printed on the door of the microwave," they snarled, shaking their Teflon spatulas menacingly.

Dren slinked away to the clothing department where he tried to ensconce himself in a dressing room; here a polyester-sheathed salesman buttonholed him and complained that static electricity from an Icelandic muff had wiped out an afternoon of data processing. Dren hovered over the computer in a nice bit of theater, already aware that there was no pulse. The Unclear really didn't have the power to keep track of a tie rack, much less a whole department.

But what is the point of training our telescope on every square yard of battlefield? Suffice it to say, the inventory could have been handled better had the clerks marked down the number of purchases on the back of an old Weedeater carton , deducted 25% for shoplifting, and flipped a nickel to close any remaining gaps.

The Trymex Unclears coughed their last—and stirred up the worst panic—in the payroll office. An overworked computer printed out a $20,000 paycheck to a stockboy who rode his bicycle to the nearest bank before payment could be stopped. His last postcard was plastered with Tahitian stamps. The machine allotted a paycheck of $1.36 cents to Dick Dren. His boss, Winemouth, suggested that this amount was more than adequate severance pay—considering the havoc brought down on the store.

Yes, small is not always beautiful—anyone who has been snapped at by a locked-up chihuahua in a parking lot knows that—and some computers can turn out just as nasty.

Grandma Makes a Wrong Turn

Out at the end of a completely different flow chart is one Grandma Leathers, who opened a little mashed potatoes shop in Peelings, Idaho. The shop soon got to be one of the most successful businesses in Tuber County. "The food is terrible," Grandma admitted, "but it's fast—and that's what people care about most. We've got a drive-up window you don't even have to slow down for. We can throw a mashed potato pie through your car window, take the license number, and send a monthly bill. If you don't pay on time , we can always resort to an old trick from the sheep and cattle wars: burn down your barn."

Eyed Vegetables Inc. grew steadily until Grandma was talked into buying a huge mainframe computer—a muscle-bound Greenby-Packard 5000 loaded with a thousand megabytes. The salesman, a Richard Tater from Pocatello, had been peddling used Pontiacs and stove-piped trailers for sheepherders when he switched overnight to computers.

The plaid-jacketed hustler with the hair combed up from the back of his neck to his occipital tori surveyed Grandma's business for about eight minutes; then, working from the premise that the bigger the computer the bigger the sales commission, he urged purchase of the GP 5000 with super quad Winchesters, supported by a whole drawerful of complex software programs including Wordscar, Visceracalc, and many others too mind-warping to mention.

It is almost incredible that a shrewd businesswoman like Grandma could be taken on such a ride, but we must consider that she was 91 at the time, and possibly some of her cerebral circuitry was starting to short out. And there may be some explanation in her description of Tater, "Dick is so sincere—and cute too—kind of reminds me of Douglas Fairbanks."

So Grandma reached into a Shirley Temple cookie jar with its nose taped on with yellowed strips of cellophane tape and pulled out wrinkled handfuls of hundred-dollar bills. Tater hadn't seen so many Franklins since the crash of the woodstove market—and Grandma had gone in only as far as the second knuckle.

Acting quickly, the salesman took it upon himself to line up some support services for Grandma's mainframe, making sure that he was getting a cut from all of them. He recommended a systems analyst, remote diagnostician, applications programmer, coordinator of operating systems software, hardware maintenance personnel, and a computer operator.

"Who is this army?" asked Grandma. "They sound like they're from outer space or Boise or something. What the devil is an applications programmer?"

"Someone to write a program that keeps track of your pie recipes," said Dren.

"But I've only got three pie recipes to work with," she told him, "plain, medium, and normal."

Within a few months the cookie jar's belly clinked a lower, emptier note, and Grandma was concerned. "The computer seems expensive," she told Tater. "Do we really need all this power?"

"Let well enough alone," the salesman told her as the two sat in front of a glowing cathode ray tube munching popcorn. The hustler enjoyed the company of this older, self-assured businesswoman. "Remember, if the dip's too thick you can kill the sheep."

"But I'm losing a fortune."

"There's more than one way to skin a grape," he advised. "Have you considered using mutton fat in your recipes instead of butter?"

"Why, I wouldn't even consider such a thing unless I were absolutely desperate," she said, reaching for the yellow pages and looking under "controlled substances." Eventually she not only used the mutton fat in place of butter, she replaced the real potatoes with "imitation freeze-dried potatoes" made from old paper-mill leavings. It had a telling effect on business. Even the graveyard shift from the mines at Anaconda couldn't handle her cooking anymore.

"Now what do I do with this fancy electronic brain?" she asked Dren, "eat it?"

"No need," he told her. "I'm taking you out for dinner at the Trail Boss In Paris Buffet."

And while the two entrepreneurs sat peeling the paté off a very rare Filet Rossini, Grandma's enterprise was buckling like a newborn lamb on bumpy ground.

A few nights later, while she sat staring into a stein at the Pine Slivers Bar, Brian the bartender—who was also doing summer theater up at Sun Valley—said "The loss must be simply devastating, Grandma dear."

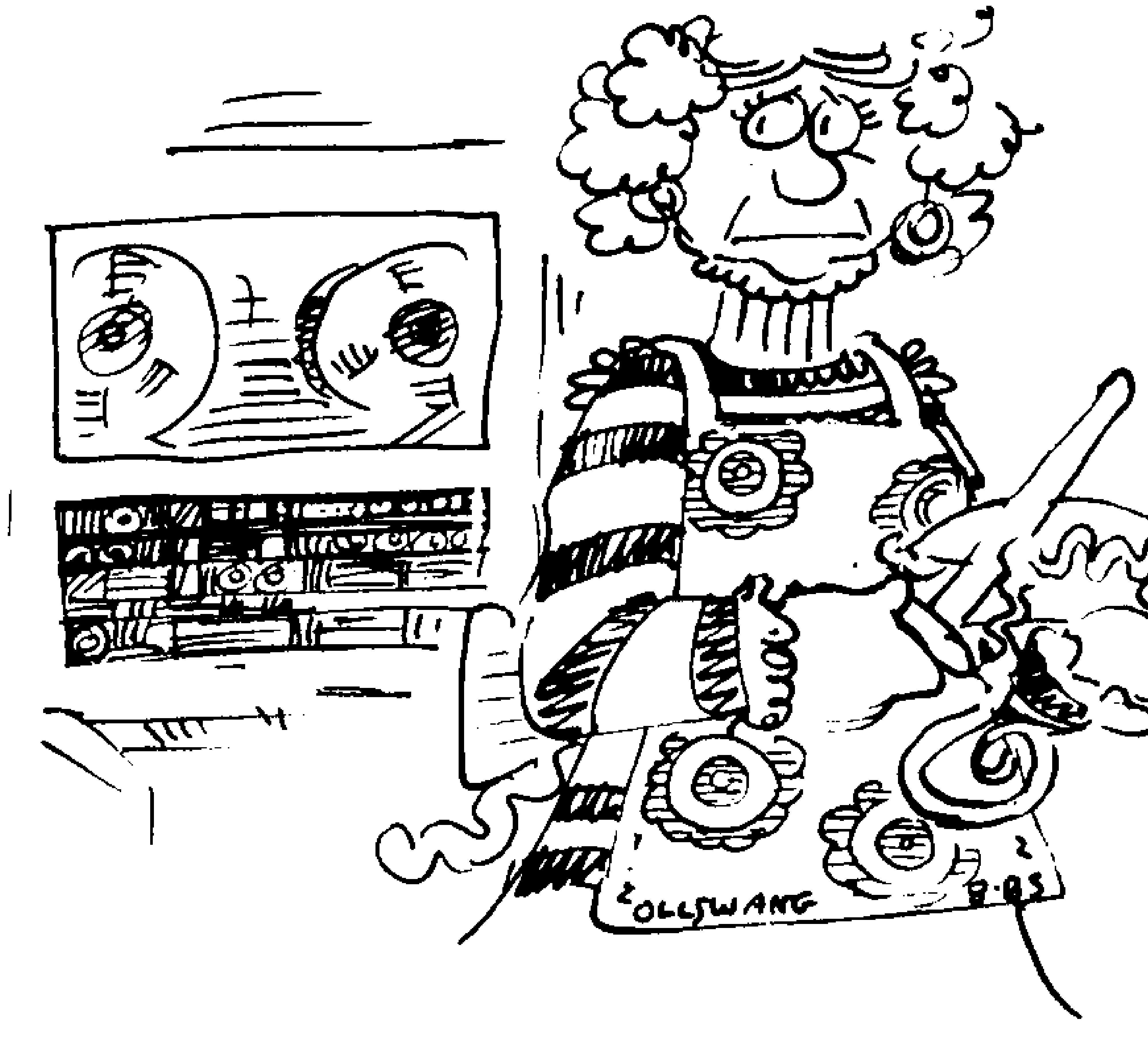
"Not really," she said wistfully. "What's a couple of million dollars to someone my age? I'd just as soon have real teeth." But she shook her head and added, "It would be nice to afford a catalytic heater for the camper—now that winter is almost here—and maybe some new eight-track Conway Twitty tapes too."

Just then the saloon doors swung open and the local barber rushed in. He handed Grandma two huge Safeway bags full of money. "This is from Dick Tater," he blathered. "He was down at the shop getting a hair transplant, and when the operation started to go bad and it looked like he might not make it, he went to pieces. He had me go over to the bank and clean out his lettuce crisper for you."

"Well, this knocks me flatter than a stepped-on horned toad," said Grandma, tipping the barber a dollar.

But there's more: Richard Tater suddenly made a remarkable comeback from the operation. He and Grandma re-opened the shop and sold off the mainframe with enough money left over to buy a TI Pegasus. Lately the couple has been spending their weekends in Twin Falls.

The moral? We won't need a consultant to tell us what that is. Ever since our first hearing of The Three Bears we've heard about a thing called "just right."



FREE OFFER!

COMPUTER CASSETTES

58¢

FREE TI-Compatible "Home Budget Planning" with each order of 20 or more C-10's

- C-10 Length
- 5 Screw Shell
- Lifetime money back guarantee
- Storage Box add 12¢ each
- $2.00 shipping charge-any quantity (Canadian Orders $4.00 shipping)
- NJ Residents add 6% Sales Tax.
- Send check or money order to

PARALLEL SYSTEMS

Box 772
Blackwood, NJ 08012
609-227-9634

?TOO CLOSE?

TO YOUR TV OR MONITOR???

Give yourself ROOM...
Avoid eyestrain with the all new

VIDEO "EX-TENSION" CABLE

This cable allows your TI 99/4 (A) to move 12 ft. from your TV or Monitor

Send $8.50 plus....$1.50 shipping to:

RIGHT IDEAS
P.O. BOX 620110
WOODSIDE, CA 94062

DEALER INQUIRIES INVITED!

ANOTHER RIGHT IDEA FROM LeVell ASSOCIATES

Come Work & Play In A Unique Environment . . .

Follow the Oregon Trail
to the Beautiful Willamette Valley

*Join a Dynamic Team
of Creative Individuals
Who Thrive on Challenge
and Cherish Their
Quality of Life.*

We are offering—

- Technical Writers/Editors
- Software Engineers
- Logic Designers
- Applications Programmers
- Advertising & Marketing Professionals

—The Opportunity of a Lifetime

Send your resume in strictest confidence to:

99'er Talent Hunt
Emerald Valley Publishing Co.
1500 Valley River Drive, Suite 250
Eugene, Oregon 97401

TI-99/4 DYNAMIC DATA & DEVICES **TI-99/4A**

DIRECT WRITER II

The "Customer Designed" Word Processor with

MORE FEATURES PER DOLLAR THAN ANY OTHER!!!!

* * *

Mix text sizes within a line on many dot matrix printers. 32 to 132 characters/line. "LIVE" editing. Faster Cursor. UNDERLINING. Displayed, storable tabulation markers. Auto-centering. Right Justify. Left Margin. And with Graftrax Plus: Superscript Subscript *Italics* ***Dble. Strike***

Plus much, much more!

Also excellent for use with "daisy-wheel" printers.

Requires Ex. BASIC, Mem. Expansion, Disk drive (1 minimum) Complete with 60 page instruction manual **$66**

DIRECT WRITER Original version	**$48**
Quimbee The Exciting Dice Game	**$20**
The Scheduler CPM Project Method	**$38**
Energy Conservation — Residential Heating Cost study program to SAVE you DOLLARS	**$28**
Learning Morse Code & Programmable Morse Code Practice Two programs for easy, effective code study	**$22**

For Purchases Mail Check Or Money Order To:

Dynamic Data & Devices
P.O. Box 912
Stafford, Texas 77477
(713) 343-0033
Add $2.00 for postage and handling

SEND FOR FREE CATALOG OR INQUIRE AT YOUR LOCAL DEALER

Assemblers . . . from p. 28

Figure 1: Assembler Statements

These samples show the form of the assembler statements for a *portion* of the sample sprite program for the three assemblers. Note that this figure shows only what you enter into the assemblers. The labels SS and SA would be defined later in the programs.

```
Figure 1A:           Figure 1B:                       Figure 1C:
Line-By-Line         MAX Assembler                    Dow Editor/
Assembler                                             Assembler

L1 LWPI >70B8         10 DATA # DEF @SPRITE           L1  :LWPI    >70B8
 LI 0,>0384           20 DATA # AORG >7D00                 LI      0;>0384
 LI 1,>FF00           30 DATA SPRITE LWPI >70B8            LI      1;>FF00
 BLWP 9>6024          40 DATA L1 LI R0.>0384               BLWP    @>6024
 LI 0>0400            50 DATA # LI R1.>FF00                LI      0;>0400
 LI 1,SS              60 DATA # BLWP @VSBW                 LI      1:SS
 LI 2,40              70 DATA # LI R0.>0400                LI      2;40
 BLWP @>6028          80 DATA # LI R1.@SS                  BLWP    @>6028
 LI 0,>0300           90 DATA # L1 R2.40                   LI      0;>0300
 LI 1,SA             100 DATA # BLWP @VMBW                 LI      1:SA
 LI 2,21             110 DATA # LI R0.>0300                LI      2;21
 BLWP @>6028         120 DATA # LI R1.@SA                  BLWP    @>6028
                     130 DATA # L1 R2.21
                     140 DATA # BLWP @VMBW
```

Figure 2: Statistics

MFGR	DISK DRIVE	PRINTER	MAXIMUM SEGMENT SIZE	LABELS PER SEGMENT	MAXIMUM PROGRAM SIZE
TI	N	N	744	9	744
ECKHAUS	N	Y	varies	108	3808
DOW	Y	Y	512	40	3808

MFGR	MAXIMUM LABEL LENGTH	NUMBER OF ASSEMBLER DIRECTIVES	SAVES SOURCE STATEMENTS	TIME TO ASSEMBLE SAMPLE
TI	2	7	N	0 MINUTES
ECKHAUS	6	11	Y	80 MINUTES
DOW	3	6	Y	5 MINUTES

Before you can execute your machine-code program from outside the Dow Editor/Assembler environment, you must make an entry for it in the REF/DEF table. You can do this easily with the MINI command, or you can use the assembler to do it. In either case, you must specify the entry point of the program (or programs) explicitly and adjust the LFAM if appropriate.

The largest program the Dow Editor/Assembler can process is 512 bytes of machine code. Again, you can segment your program if necessary. The manual estimates that this is roughly 150 source statements, but this can vary greatly. You can see how close you're getting by looking at the program counter as you go along; the beginning of the program is at absolute location 0 as far as this counter is concerned. Each segment can be SAVEd to tape by the Dow Editor/Assembler and LOADed into Mini Memory at a different address. You can start the next segment with a NEW command and finish the whole process without ever leaving the assembler.

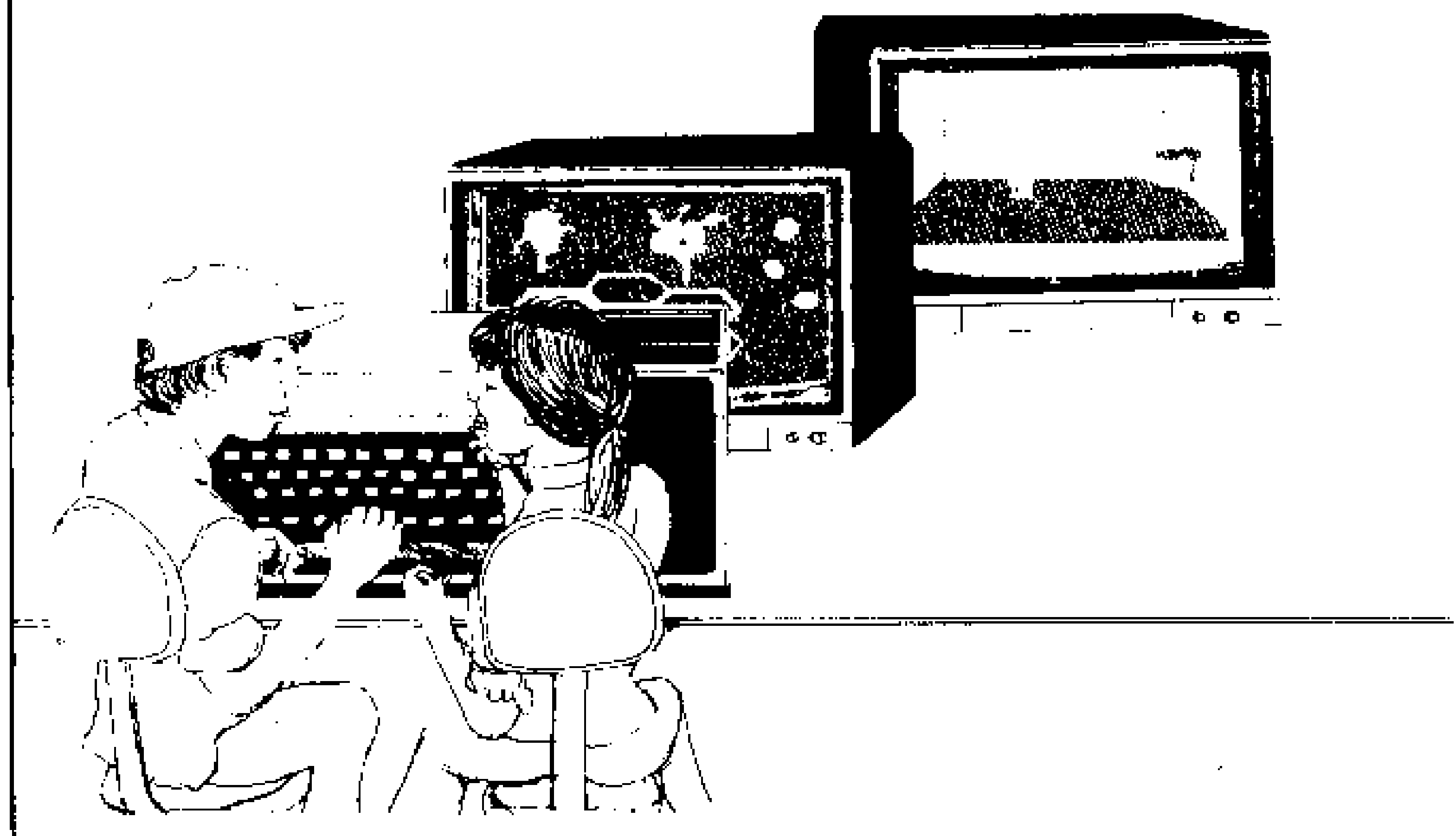
When you need to change a program, you use the OLD command to read it from tape and then edit it. When the revisions look correct, you LOAD the entire program or segment to Mini Memory again.

The Dow Editor/Assembler can work with a printer or a disk drive. You must change the assembler program (in BASIC) to use either peripheral. Directions for this are provided in the manual.

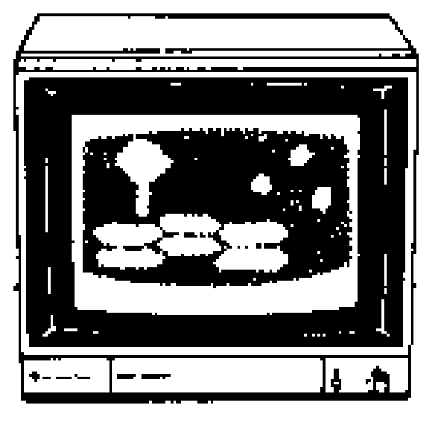
Summary

The TI Line-by-Line Assembler, the MAX Assembler and the Dow Editor/Assembler all help you accomplish the task of turning your Assembly Language idea into machine code. Your own needs—whether you want to use a printer and disk drive or modify your source program, as well as your speed preference and programming style—will determine your best choice. Hopefully the descriptions of these three assemblers will help you understand the differences between them and choose the most efficient one for you.

It's easy to let children play.
Our games help them learn.
— Intellestar



BUILDING BLOCKS OF LIFE:

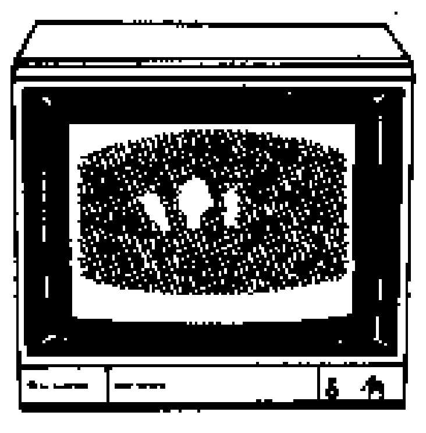


Part One, Two and Three
These are the first three in a series of programs that will take you and your students through all of the human body.

Part one explores the nature of protoplasm and shows the interaction of cells. Part two shows the inner workings of the cell. Part three shows cellular division as a step by step process.

Realistic animation and appropriate text combine to make highly effective programs geared toward grades four and up.
All Three for...............**$19.95**

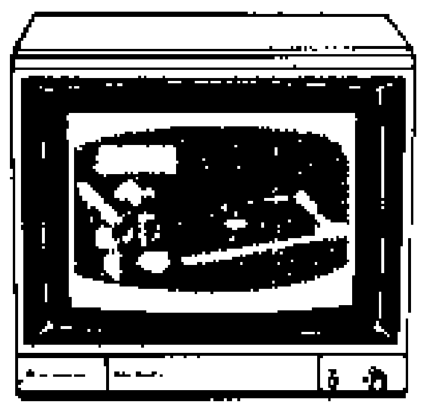
TURN THE WATER OFF



A spelling game with super 3-D graphics. The sink in Simon's room is overflowing. Can you guess the mystery word before the room fills with water?

This game allows easy creation of word files for a customized spelling program. Your kids will love it..........**$14.95**

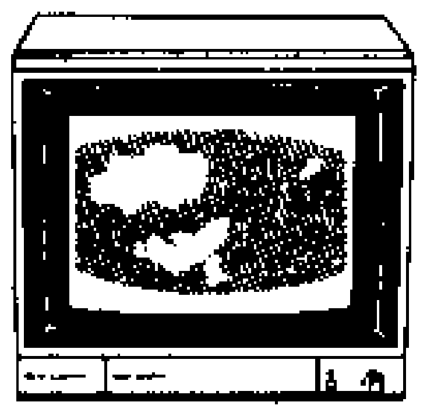
THE LEARNING CENTER



Meet your kids on their level with four exciting, highly graphic games that teach while they entertain.

The learning center contains a mini-authoring system which allows you to create endlessly varied files of information around which games are played.**$39.95**

FIREBALL



Players lock missiles on target to save the Planet Terra. Players must answer queries in mathematics to proceed with the game while improving their speed and accuracy with math facts.

Many levels of difficulty and great arcade graphics make a game children will want to play again and again........**$14.95**

All software described in this advertisement requires Extended Basic.

Shipped without delay. **One year guarantee.**
Mastercharge/VISA add 3%

- **All of our software is created by professional educators and field tested in public schools.**
- **Test sights are available upon request.**
- **Custom software and educational consultation are available upon request.**

Send for our catalog if you would like more information.

Software by Intellestar

INTELLESTAR
25 West Middle Lane
Rockville, MD 20850

We Take Our Time To Get It Right.

ASSEMBLY LANGUAGE TEXT PROCESSING:
COMPANION

A lightning fast writer-oriented word processor which treats your text conceptually. Type it as one long phrase: COMPANION completely reformats it for printout, subject to simple text-imbedded commands which continuously dictate the desired format and printer mode. ALL text manipulation routines in TRUE ASSEMBLY LANGUAGE.

■ MENU driven ■ SEVEN cursor motion keys ■ Excellent FULL-SCREEN editor ■ ACCELERATING auto-repeat
■ 18000 character memory CAPACITY ■ Virtually INSTANTANEOUS correction, deletion, and insertion
■ Text imbedded commands provide CONTINUOUS control of ALL FOUR margins, indentations, spacing, form width, etc.
■ COMPLETE control of printer mode ■ Prints ANY ASCII character, codes 0-255 ■ Automatic CENTERING
■ UltraFAST loading ■ FULL ERROR RECOVERY ■ EIGHT completely independent tab sets ■ DETAILED manual
■ Prints on almost ANY modern tractor feed printer ■ Page numbering: AUTOMATIC or suppressed
■ Flexible BATCH PROCESSING capabilties ■ Ph.D. designed, written, and documented ■ WRITE for free brochure
■ Requires 99/4A, Extended Basic (new version, Version 110), RS232, Disk Drive & Controller, Memory Expansion

Diskette $64.95 **INTELPRO** **(514)-656-8798**
5825 Baillargeon St., Brossard, Quebec, Canada J4Z 1T1

Still think the 99/4A is a slow machine? One benchmark we ran took 3 minutes and 40 seconds in BASIC. It ran in 7 seconds in

FORTH

For the 99/4 and 99/4A. Extended Memory required. You also must have one of the following modules:

Editor/Assembler, Minimemory or Extended Basic. Please state disk or cassette system, and the host module when ordering.

Extended Basic version available for disk only.

Wycove Forth: $40
Add $10 for source code if desired.

WYCOVE SYSTEMS LIMITED
P.O. BOX 1105
Dartmouth, Nova Scotia
B2Y 4B8 Canada

Crime and Punishment

At last a socially responsible game!

Tired of shooting aliens? Like to use your computer to tackle *real* life problems? Then try CRIME AND PUNISHMENT.

■ You decide on punishments for murderers, robbers, embezzlers, burglars and many more—over 1,000 unique cases.

■ Your sentences are compared to those of *actual* trial court judges—collected from years of painstaking research.

■ **Educational**: Extensively documented—learn *how* to make wise decisions—find out what *really happens* in criminal trials.

■ **Fun**: Lots of TI graphics and sound. Find out your decision-making I.Q.!

TI BASIC - CASSETTE - $16.00

Send check or money order to:

Decision-Making Systems Ltd.

P.O. Box 9557, Wilmington, DE. 19809.

Watch for Search and Seizure and others in our series of *games with a conscience!*

Persuasion . . . from p. 55

in the barcap and how much is in the barhead is fixed by the data values for bar heights.

The bar ends up having three parts. Figure 3 shows these three parts and gives parameters for the datum used in the figure as an example.

Payoff With the Microcomputer

Many people enjoy looking at good graphs. It is especially pleasing to view them on a color monitor. It is exciting to watch one come into existence right before your eyes. In the past I used graphs sparingly because they were so time-consuming to produce. Also, a good graph, produced with pens, brushes, and transfers, requires a lot of work. A commercial artist will charge you $50 for a custom graph on a 35mm slide. The money spent on ten slides buys you a TI-99/4A with color monitor, and with this set-up you can have dozens of graphs on 35mm slides or prints just for the cost of film and processing.

But the real payoff comes in real time. In real time you can have hundreds of bright, vivid, colorful graphs for use with your business, your classes, your church, your family, or whatever. In fact if Confucious were alive today, he would probably concur that a computer bar graph is worth 1,000 print-outs.

Bargrapher

Explanation of the Program

Line Nos.	
100-270	Program header.
280-650	Defines labels.
660-990	Defines bars and barcolors.
1000-1260	Prints baselines, grid lines, tick marks and labels.
1270-2080	Draws bars.
2090-2230	Creates title box.
2240-2400	Creates second line in title box if necessary.
2410-2460	Subroutine to print vertical labels.
2470-2510	Subroutine to print horizontal labels.
2520-2560	Subroutine to print bar stems.

```
REM **************
REM * BARGRAPHER *
REM *     BY     *
REM * FRED ELLIS *
REM **************
REM
REM  99'ER VERSION 2.10.1
REM PRESS ANY KEY TO EXIT PROG
RAM.
REM ABOUT 10400 BYTES
REM RESERVED TO OPEN FILES
GOTO 680
REM INSTRUCTIONS: STATEMENTS M
OST LIKELY TO BE CHANGED ARE B
ETWEEN THE BARBED WIRE -*-*-*-
.
REM INSTRUCTIONS: ADD DESIRED
TITLE AS 'TITLELINE$'. TO MOVE
 TITLE BOX CHANGE 'RO' AND 'CL
'.
REM  ADD DESIRED LABELS AS 'LA
BEL$'. LOCATE THE LABELS WITH
'ROW' AND 'CLMN'. THERE ARE TW
O
REM  SUBROUTINES FOR LABELS. O
NE MAKES HORIZONTAL LABELS AND
 THE OTHER MAKES VERTICAL LABE
LS.
REM ENTER DATA FOR THE BARS AN
D FOR THE PERCENTS IN THE DATA
 STATEMENT. CHOOSE COLORS FOR
BARS AS
REM 'BARCOLOR1', 'BARCOLOR2',
ETC.
REM -*-*-*-*-*-*-*-*-*-*-*-*-*
REM *------- SUBROUTINE FOR
LABELS --------*
TITLELINE1$="CITY OF"
TITLELINE2$="MCALLEN"
RO=3
CL=18
LABEL$="GOVERNOR"
ROW=12
CLMN=11
GOSUB 2420
LABEL$="CONGRESS"
ROW=12
```

TEXWARE ASSOCIATES
PRESENTS
Innovative, Educational and Entertainment Software for the TI 99/4A

?????QUIZMASTER?????

A new concept in computer aided learning. Quiz yourself on any subject with up to 50 pairs of questions and answers at one time. Quiz yourself using one of three formats: sequential quiz, timed quiz, or random quiz. You may enter your own questions and answers.

No programming knowledge is necessary. Preprogrammed quizzes available for purchase. List included with program, or upon request. Available only in BASIC for $24.95.

CHECK BOOK BALANCER

Use the CHECK BOOK BALANCER to reconcile your check book with your monthly bank statement. Excellent aid for finding mistakes. Just enter the information requested by the computer, and the program does all the math for you. Available only in BASIC for $9.95.

Algebra I

This program contains all the lessons found in a standard Algebra I course. Excellent supplementary learning aid for students taking high school Algebra I. Comes on twelve cassettes with a detailed instruction manual. Each lesson has a teaching section and a problem set. List of all topics covered available upon request. Demonstration program available for $5.00. This cost may be deducted from the price of the program if you decide to purchase Algebra I. The rest of the High School Math Series (Geometry, Algebra II, Trigonometry) will become available in the next 12 months. Algebra I is available only in BASIC for $59.95.

All programs available on cassette or disk. Specify choice.

Dust Covers

Durable black vinyl dust covers to protect your equipment:

A001	TI-99/4A Console Cover	$ 7.50
A002	10" Color Monitor Cover	$ 8.95
A003	Peripheral Expansion Box Cover	$10.95
A004	TI Solid State Printer Cover (same as Epson MX-80)	$ 7.50
A005	Okidata Printer Cover	$ 7.50
S006	Disk Memory Drive Cover	$ 5.95
A007	Speech Synthesizer Cover	$ 3.95
A008	TI Program Recorder Cover (will fit cassette players 10½" x 6" or smaller)	$ 4.75

INQUIRE FOR INFORMATION ABOUT OUR SOLID WHITE PINE COMPUTER DESKS.

To save C.O.D. charge send check or money order. Add $1.50 postage & handling for orders UNDER $15.00. Illinois residents add 5% state sales tax. Send to:

TEXWARE ASSOCIATES
350 FIRST NORTH ST.
WELLINGTON, IL 60973

```
390 CLMN=25
400 GOSUB 2420
410 LABEL$="CLEMENTS"
420 ROW=22
430 CLMN=4
440 GOSUB 2470
450 LABEL$="HILL"
460 ROW=23
470 CLMN=12
480 GOSUB 2470
490 LABEL$="MC-"
500 ROW=22
510 CLMN=20
520 GOSUB 2470
530 LABEL$="DONALD"
540 ROW=23
550 CLMN=18
560 GOSUB 2470
570 LABEL$="DE LA"
580 ROW=22
590 CLMN=26
600 GOSUB 2470
610 LABEL$="GARZA"
620 ROW=23
630 CLMN=26
640 GOSUB 2470
650 RETURN
660 REM *---- END OF SUBROUTINE
FOR LABELS ---*
670 DATA 4535,58,3317,42,3929,50,3
845,49
680 BARCOLOR1=5
690 BARCOLOR2=11
700 BARCOLOR3=7
710 BARCOLOR4=3
720 SCALE=500
730 SCALE$="9 8 7 6 5 4 3 2 1 0"
740 VERTICAL1$="VOTES IN"
750 VERTICAL2$="THOUSANDS"
760 REM  *--- CHARACTERS 91,92, AN
D 93 ARE AVAILABLE FOR TICK
MARKS ---*
770 DATA 91,0000000000000038,92,00
000000000000FE,93,000000000000
0038
780 REM -*-*-*-*-*-*-*-*-*-*-*-*-*
790 DATA 94,FF0000000000003C,95,00
80FE0092FE00E0,96,FFFF00FF0000
FF00,97,C0C000FF0000FF00,98,00
0000FF0000FF00
800 DATA 99,030300FF0000FF,104,004
F79004F007F00,105,7F00497F0001
487F,106,00FE90F000FE90F0,107,
00000000000000FF
810 DATA 112,C0C0C0C0C0C0C0C0,113,
00,114,0303030303030303,120,C0
C0C0C0C0C0C0C0,121,00,122,0303
030303030303
820 DATA 128,C0C0C0C0C0C0C0C0,129,
00,130,0303030303030303,136,C0
C0C0C0C0C0C0C0,137,00,138,0303
030303030303
830 DATA 144,FFFF000000000000,145,
FFFFFCECFCFCC0C,146,C0C0C0C0C0
C0C0C,147,C0C0FCFCECFCFFFF,148
,000000000000FFFF
840 DATA 149,03033F3F373FFFFF,150,
0303030303030303,151,FFFF3F373
F3F0303,152,00000000000000FF,1
53,FF
850 RESTORE 770
860 FOR K=1 TO 35
870 READ CHARACTERNUMBER,HEX$
880 CALL CHAR(CHARACTERNUMBER,HEX$
)
890 NEXT K
900 CALL COLOR(9,2,14)
910 CALL COLOR(10,2,8)
920 CALL COLOR(11,2,BARCOLOR1)
930 CALL COLOR(12,2,BARCOLOR2)
940 CALL COLOR(13,2,BARCOLOR3)
950 CALL COLOR(14,2,BARCOLOR4)
960 CALL COLOR(15,16,8)
970 CALL COLOR(16,16,8)
980 CALL SCREEN(8)
990 CALL CLEAR
1000 REM *------ BASELINE AND GRID
LINES ------*
1010 COL=1
1020 CALL HCHAR(21,COL,96,33-COL)
1030 FOR ROW=20 TO 2 STEP -2
1040 CALL HCHAR(ROW,COL+1,152,30)
1050 NEXT ROW
1060 CALL HCHAR(1,COL+1,153,30)
1070 REM *---- VERTICAL SCALE ----*
1080 LABEL$=SCALE$
1090 ROW=2
1100 CLMN=2
1110 GOSUB 2420
1120 REM *----- TICK MARKS -----*
1130 CALL HCHAR(23,COL,105)
1140 CALL HCHAR(22,COL,104)
1150 CALL HCHAR(23,32,106)
1160 CALL HCHAR(22,32,95)
1170 FOR ROW=20 TO 2 STEP -2
1180 CALL HCHAR(ROW,COL,92)
1190 CALL HCHAR(ROW-1,COL,91)
1200 CALL HCHAR(ROW,32,92)
1210 CALL HCHAR(ROW-1,32,93)
1220 NEXT ROW
1230 CALL HCHAR(1,COL,94)
1240 CALL HCHAR(1,32,94)
1250 REM *-------- LABELS --------*
1260 GOSUB 290
1270 REM *------- DRAW BARS -------*
1280 MASTER1$="0000000000000FFFFF
FFFFFFFFFFFFC0C0C0C0C0C0C0C0
C0"
1290 MASTER2$="7F00497F0001487FFFFF
FFFFFFFFFFFF000000000000000000
00"
1300 MASTER3$="004F79004F007F00FFFF
FFFFFFFFFFFF0303030303030303
03"
```

Continued on p. 98

ATTENTION PARENTS & TEACHERS

At Last

A Spelling Program That Uses

Your Kid's Own Spelling Words!!

* * *KID-SPELL* * *

Each week you add new spelling words; no programming required. Developed by educator/mom of learning-disabled kid who is *now* a 95-100% speller (v. 15-25% before). In TI BASIC on cassette with instructions. Adjustments for use with TE II and Speech synthesizer provided. $9.95!!

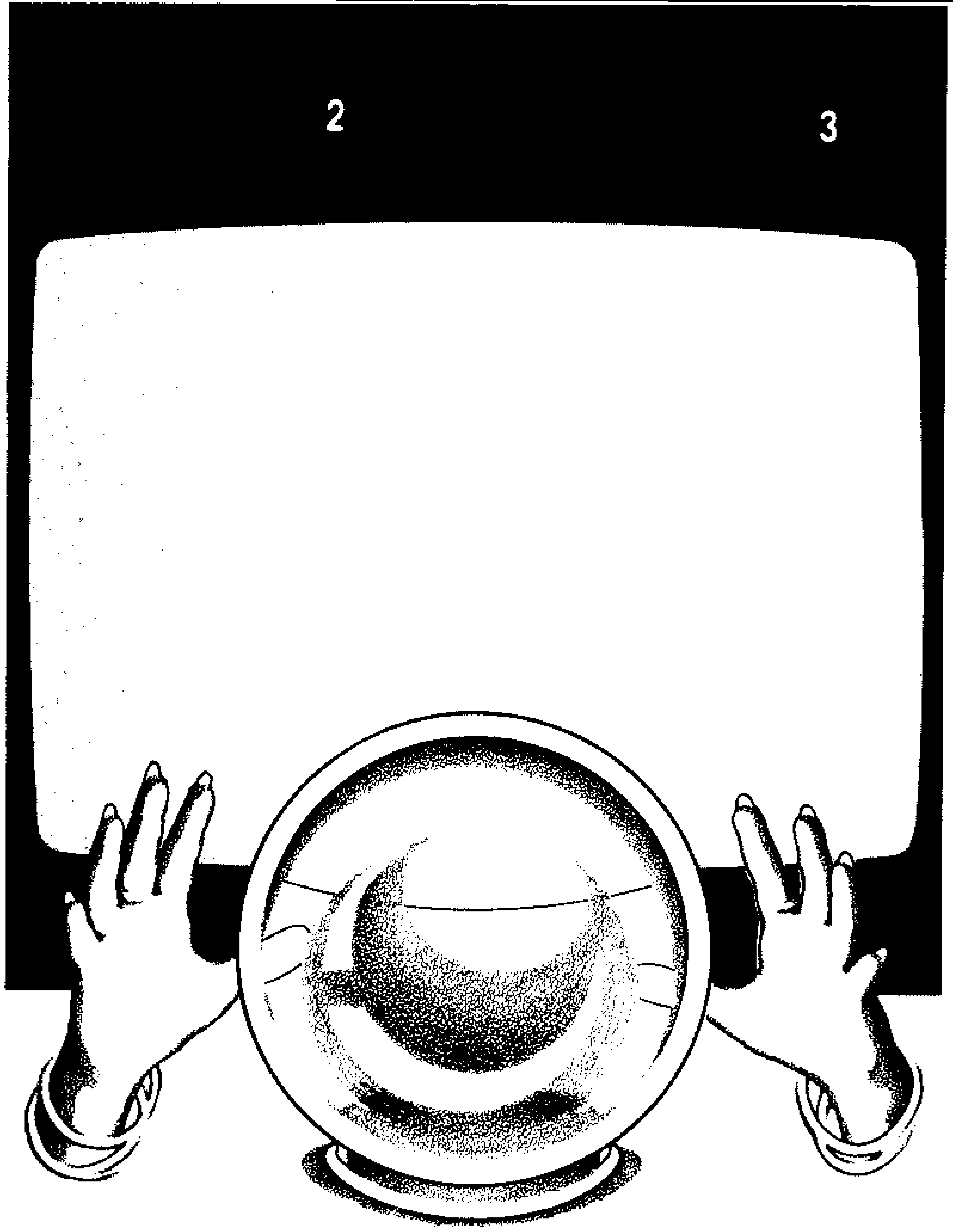
♡ Dr. Mom's Kidware
5357 Carrollton Avenue
Indianapolis, IN. 46220

EASYWARE
27087 Brettonwoods
Madison Hts. MI 48071
(313) 541-2031

ZOOT SHOOT

In the Beta Sector, your new mission--stop the uprising of the ZOOTIAN MUTANTS. Use the gun sight on your Star Cruiser to aim your phaser and blast the Zootians before they use their phasers or deadly KAMIKAZOOT to wipe you out. 5 levels of play, 1-2 players. Joysticks optional. Arcade graphics and sound. $17

TI-EXTENDED BASIC
CASSETTE • TI-99/4A
complete instructions included
S.A.S.E. for FREE CATALOG



This column is an ongoing tutorial on the *Multiplan* software package. To obtain full benefits from this column, a newcomer to *Multiplan* may find it useful to read the previously printed columns.

The smallest addressable unit on the *Multiplan* worksheet is the cell. This means that you can "converse" with *Multiplan* about the contents of any cell on the worksheet. But *Multiplan* is not just a single-celled organism. In many cases, it can think in terms of rectangular groups of cells. And this capability expands *Multiplan's* usefulness significantly.

Rectangular groups of cells go by many names: tables, matrices, arrays. What you call a particular area depends on both its contents and how it will be used. You use a special syntax to indicate a rectangular area to *Multiplan*, namely *upper-left-cell: lower-right-cell*. For example, in Figure 1 the boxed area would be called R1C1:R4C3.

Once you start thinking in terms of rectangular areas, you will see how basic this concept is to *Multiplan*. Rows and columns on the worksheet are just rectangular areas which are one cell wide or long respectively. Even a single cell is just the smallest possible rectangular area.

Commands and Rectangular Areas

You can refer to rectangular areas in five of *Multiplan's* commands: Blank, Copy, Format, Name, and Print. Copy is the most interesting of these, so we will explore it first.

The Copy command has three sub-commands: Right, Down, and From. Copy From lets you move a whole rectangular area to another part of the worksheet while retaining it in the original spot as well. You can also Copy From a single cell to a rectangular area, although this is not nearly so useful. To see the difference, refer to Figure 1. The original worksheet contained only the rectangular area R1C1:R4C3. The top part of Figure 1 was the result of copying from R1C1:R4C3 to R6C2. Notice that you don't have to specify the boundaries of the destination area; *Multiplan* assumes that you are referring to the upper left corner of a rectangle that is the same shape as the "from" area. The lower part of Figure 1 was produced by copying from R1C1 to R6C2:R9C4. In this case the single "from" cell was duplicated throughout the rectangular destination.

Copy Right is a special case of Copy From. You can use Copy Right to make more than one copy of a rectangular area, but the cells you copy from must all be in the same column and the destination area(s) must be in adjacent columns. Copy Down is similar to Copy Right except that portions of rows are copied to adjacent rows. There is one thing you should always keep in mind when you use all the Copy commands. The information in the destination areas is wiped out when it is replaced, so you can lose whole areas of your worksheet by specifying a destination which contains information you meant to keep.

If you have a rectangular area that will be used frequently on your worksheet, then you may want to Name it to make things easier on yourself. The Name command assigns the label of your choice to the area. After that you can refer to it by its label instead of the more cumbersome upper-left: lower-right notation.

The Blank command is used to blank out areas on a worksheet. If you use the Copy commands extensively, you will sometimes find that a finished worksheet has several cells containing zeroes. You can use the Blank command to clean up your finished worksheet.

The Print Options command lets you designate any rectangular area for printing. If you don't want to print the whole worksheet, use Print Options to specify the area to be printed, and then use Print Printer to actually print it out. This is a real time- and paper-saver when you are developing a worksheet.

The Format Cells command can be used to change the format in which the contents of a cell (or area of cells) are presented. A common example, which we have seen before in this series, occurs when most of the figures on a worksheet are dollars and cents but you need to use whole numbers in one column. You can accomplish this by setting the default format (command Format Default) to the most common format (say dollars and cents) and then using the Format Cells command to change just the area you need to integer format.

Multiplan makes it easy to use the complicated-looking rectangular area designations. You don't have to type them in; you can use the cell pointer to indicate the boundaries of the area you want. After you have selected the command (and possibly the sub-command) and arrived at the spot where the designation should be placed, just move the cell pointer to the upper-left cell of the area (if it's not already there). Then type : (colon) to tell the system you're ready to do the lower-right cell. Then move the cell pointer to the lower right boundary of the area. *Multiplan* will build the area designation on the command line for you as you follow these steps. This technique helps prevent mistakes, and it's easier on non-typists.

Tables

A *table* is a very useful type of rectangular area. As you might suspect, tables are used for looking up information. With

Multiplan you can define a table on the worksheet and reference it from other places on the sheet.

An example which jumps to mind is preparing estimates for repair work. Imagine you run a very specialized business which repairs just one type of sewing machine. These hypothetical machines are so simple that most repairs consist of 5 common jobs. The business offers free repair estimates, and you would like to automate these estimates to cut down on the time it takes to prepare them and to increase their accuracy by eliminating addition errors.

Figure 2 shows the model for this example. I have taken poetic license and shown a bit more here than would appear on the screen at any one time. The "job table" for these 5 common jobs is at the bottom of the worksheet. To keep things simple, numbers 1 though 5 were assigned to the jobs. Each job has a verbal description, a price for parts to be used, and an estimated number of hours it takes to do the job. This description is there to save time; you only have to type the one-digit job number instead of the longer description. The parts prices are kept separately so they can be changed easily when appropriate. The labor is depicted in hours so that the labor portion of each job can be figured against the shop's current hourly rate, which may change from time to time. To make this figure meaningful, we will have to supply the hourly rate elsewhere and have *Multiplan* do the calculation. Because we will refer to this job table often, we will name it TABLE. Use the Name command, and specify TABLE to refer to R19C1:R23C4.

Now to set up the estimate form itself, shown in the upper part of Figure 2. The company's heading is typed in, and the hourly labor rate is also prominently displayed. Space is left to fill in the current date when the estimate is used. The plan is to have the person type only job number(s) and have *Multiplan* fill in the rest of the row. When job number is filled in, the program should get the description from the table and plug it in. The amount for each item should be calculated as the parts price plus the labor hours, multiplied by the labor rate.

To calculate this we will use the INDEX function. INDEX returns the value of a cell from a table, which is just what we need. The general form of the function for this case is INDEX (TABLE, row, column). This example will be very simple because the job numbers 1 through 5 can be used as the row designators in the INDEX function. When we want to get the description, we'll specify column 2. In other words, the description for job #3 would be just INDEX (TABLE,3,2). Similarly, the parts price is always in column 3 and the labor hours are in column 4. Thus the only variable we'll have is the job number; everything else depends on that.

Now to make the formulas for the first detail row of the estimate. The job number will be filled in when the worksheet is actually used; leave it blank for now. Under DESCRIPTION, we want to use INDEX (TABLE,RC[-1],2). To enter this, put the cell pointer at row 9, column 2 and type = to indicate that a formula will follow. The formula can be typed in directly, except that the RC[-1] can be indicated by moving the cell pointer 1 column to the left. Don't be surprised at the #REF! error which results; that happens because we haven't filled in a job number yet, so *Multiplan* is unable to look it up right now.

The next thing to do is to fill in the formula for AMOUNT. This gets a bit complicated. For one thing, we'll need to use the labor rate here. First we Name the cell containing $25.00 so we can refer to it by name; let's call it RATE. Now put the cell pointer in the first row under AMOUNT, type =, and then enter the formula: INDEX(TABLE,RC[-2],3)+INDEX (TABLE,RC[-2],4)*RATE. The RC[-2] terms refer to the job number again. In English, this formula is just parts amount + hours × rate. Notice that we don't need parentheses around the hours × rate term because *Multiplan* automatically does multiplication before it does addition. The REF! message will appear here too, but it will go away when we fill in a job number.

So much for the prototypes of the formulas. If an estimate has more than one detail line, the person can Copy Down the pro-

Figure 1: Rectangular Areas and Copying

```
#1          1           2           3           4
 1   A A A A                  1     $1.00
 2   B B B B                  2     $2.00
 3   C C C C                  3     $3.00
 4   D D D D                  4     $4.00
 5
 6               A A A A                  1     $1.00
 7               B B B B                  2     $2.00
 8               C C C C                  3     $3.00
 9               D D D D                  4     $4.00
10
11
12
13
14
15
16
17
18
COPY FROM cells:R1C1:R4C3 to:R6C2
•••••••••••••••••••••••••••••••••••••••••••••••••••••
#1          1           2           3           4
 1   A A A A                  1     $1.00
 2   B B B B                  2     $2.00
 3   C C C C                  3     $3.00
 4   D D D D                  4     $4.00
 5
 6               A A A A     A A A A     A A A A
 7               A A A A     A A A A     A A A A
 8               A A A A     A A A A     A A A A
 9               A A A A     A A A A     A A A A
10
11
12
13
14
15
16
17
18
COPY FROM cells:R1C1      to:R6C2:R9C4
```

Figure 2: Estimate Model

```
          1            2                   3                   4
 1                SWANSON REPAIR      OUR CURRENT RATE IS
 2                128 MAIN ST.          $25.00 PER HOUR
 3                NEWTON. OR 98765
 4
 5                REPAIR ESTIMATE     6/15/83
 6
 7
 8         JOB #  DESCRIPTION          AMOUNT
 9                3 REPAIR PLATE        50.00
10                2 ALIGNMENT           26.50
11
12
13
14
15                TOTAL                 76.50
16
17   JOB TABLE:
18         JOB #  DESCRIPTION           PARTS               HOURS
19                1 REPLACE
                  MOTORS                59.95                0.50
20                2 ALIGNMENT            1.50               $1.00
21                3 REPAIR PLATE        25.00                1.00
22                4 GEN. OVERHAUL       12.50                1.50
23                5 REPLACE ARM         48.00                1.25
```

Figure 3: Printed Estimate

```
SWANSON REPAIR               OUR CURRENT RATE IS
128 MAIN ST.                   $25.00 PER HOUR
NEWTON, OR 98765

REPAIR ESTIMATE             6/15/83

DESCRIPTION                              AMOUNT
REPAIR PLATE                              50.00
ALIGNMENT                                 26.50

TOTAL                                     76.50
```

ARE YOU PSYCHIC?
Scientists call it "PSI".

Computerized testing is a scientifically sound, entertaining method of evaluating and training psi abilities. Test and train your mind in precognition, psychokinesis, and extrasensory perception. Such abilities are useful for practical purposes in business forecasting, police investigation and personal relations.

Jeffrey Mishlove, President of Spectrum Software, received a Ph.D. in parapsychology from the University of California, Berkeley. He is the author of numerous publications on testing, training and practically applying psi abilities.

PSI LAB includes all of the following:

Stock market precognition program.
Blackjack ESP simulation.
Slot machine ESP simulation.
Color guessing ESP test.
Looking for oil ESP simulation.
"Free-response" psychokinesis test.
"Confidence calling" test for ESP training.
"Speak to Me" psi-mediated conversation.
Randomness check of the computer.
Statistical analysis of psi tests.
A complementary issue of *Applied Psi Newsletter.*
A list of scientific papers on computer testing of psi.
Information about a computerized parapsychology network.
Instruction booklet written by Dr. Jeffrey Mishlove.
A catalog of books and tapes on psi research.

Plus these extra programs!

A financial package for loans and investments.
Seven color graphic animated designs.

ALL OF THIS FOR THE UNBELIEVABLY LOW PRICE OF $29.95.
(Plus $2.00 for handling and shipping, and sales tax in California)
DO YOU BELIEVE??? TEST FOR YOURSELF!

Phone in your order on our free 800 lines:
800-227-1617 ext. 396 (outside Cal.)
800-772-3545 ext. 396 (in Cal.)
VISA and MASTERCHARGE accepted.

PSI LAB:	**$29.95**
SHIPPING:	**2.00**
Subtotal:	**$31.95**
6% in Cal.	**1.80**
TOTAL	**$33.70**

Or send your payment with the following coupon to:

Spectrum Software
190 25th Ave.
San Francisco, CA 94121

Name ____________________
Street ____________________
City/State/Zip ____________________
Visa ☐ **MC** ☐ **Card No.** ____________________
Exp Date ____ **Signature** ____________________

totypes as many lines as needed. We don't want to do that in the model because of the REF! messages, which will remain if there is only one detail line on a particular estimate. But since the maximum job might have 5 detail lines, we want to leave the next five lines clear in case they are needed. We need a total line, so let's put that on row 15. Enter TOTAL under DESCRIPTION. Move over under AMOUNT and fill in the formula SUM(R[-7]C:R[-1]C) using the cell pointer to refer to the rectangular area to be summed into the total.

There's one more thing to consider before we declare the model finished. Presumably the customer will receive a copy of the estimate, but he or she should not get a copy of the jobs table. The job number is also meaningless to the customer. *Multiplan* can take care of this easily. Use the Print Options command to designate that only the area R1C2:R15C4 be printed. Then save the finished model.

The next time an estimate is to be prepared, call up a copy of your model (via the Transfer Load command). Fill in the date. If only one detail line is needed, simply fill in the job number at row 9, column 1. If you need three detail lines, Copy Down 2 cells from R9C2:R9C3 and then fill in the three job numbers on rows 9 through 11. Then print the estimate (and possibly an extra one for your own records), and you're done. Figure 3 shows a printed estimate containing two detail lines.

Absolute vs. Relative References

This example points out the need to distinguish between absolute and relative cell references. A cell reference such as R1C1 is called absolute because it refers to a definite cell, the one at the home position. There is no possible ambiguity with a reference like this. The labels TABLE and RATE are both absolute references.

A cell reference such as RC[-2] is called a relative reference because it designates a cell only with reference to the present location of the cell pointer. This particular example means "the cell which is in the same row and two columns to the right of where I am now," so the meaning of this reference can vary.

In the estimate example, we used relative references for the job number in the INDEX functions. This was because the prototype detail line might be copied down in the future. Suppose we had been short-sighted and specified the DESCRIPTION formula as INDEX(TABLE,R9C1,2) instead of INDEX(TABLE,RC[-1],2). The first line of the estimate would be fine, but what would happen when it was copied down to the next line? The absolute reference would cause *Multiplan* to base the second line on the job number in the first line, with disastrous results.

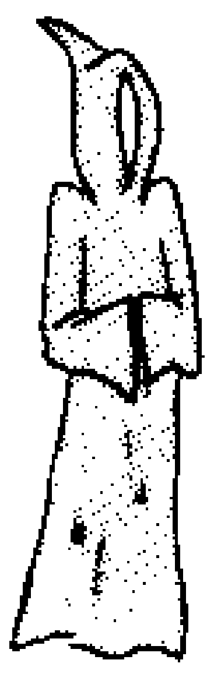
But don't think that the safe way is to make all references relative. Consider the labor rate, which was an absolute reference in the example. Suppose we had decided to make that a relative reference too. Then suppose that instead of typing RATE (or using its absolute address of R2C3), we had used the cell pointer to pick out that cell in our prototype AMOUNT formula. This would have put R[-7]C in place of RATE in the formula. Again, this would have been fine in the first line of the estimate. But how about the second line, if the formula was copied down? The reference would be one row too low; *Multiplan* would pick up 0 for the labor rate because the referenced cell (R3C3 this time) is blank. As you can see, the concepts of rectangular areas, and relative and absolute addressing are central to understanding *Multiplan*.

MOVING?
Don't Miss Out On Any Issues Of
99'er HOME COMPUTER magazine

Send us a Change-of-Address Card
(available at any Post Office)
6-8 weeks prior to the move.
Be sure to include both the old & new address,
plus the alphanumeric code above
your name on the mailing label.

WIZARD'S DOMINION

99/4 **A Fantasy Adventure** 99/4A



The Voritka Ogres are on the prowl. Only the Wizard's Apprentice, the Evil Wizard, the Hero and the Evil Prince have enough courage to defeat them and rule Wavoria. Inside the caverns of The Wizard's Dominion lay gold, adventure and magical powers.

- 3-D Perspective
- Superb Graphics
- Ages 12 to Adult
- Magical Powers Galore
- Complex Battles
- Many levels to Conquer

IMPROVED - VERSION 2.0 NOW AVAILABLE

Extended Basic Language

All this for only!! $19.95 cassette $21.95 disk

Spelling Teacher

Spelling teacher is designed for students to enter their weekly spelling list from school. After you enter the words you want to study, the spelling teacher will flash the words back for you to spell. Flashing the word back for a fraction of a second actually reinforces correct spelling. The computer remembers the misspelled words and goes over them with you to help you learn them. A speech option is included for those with the speech synthesizer and terminal emulator II. Basic Language $19.95 Cassette, $21.95 Disk.

Many other programs in Basic & Extended Basic available. Write for more information.

Complete instruction included. To save C.O.D. charges, send check or money order plus $1.50 shipping/handling. MN residents add 6% sales tax.

ASD&D

AMERICAN SOFTWARE
DESIGN & DISTRIBUTION CO.
P.O. BOX 46 B
COTTAGE GROVE, MN 55016-0046

BeeJay FUNWARE

BLACKJACK - One or two players against the house. Follows all Vegas rules. Excellent graphics. Multiple decks. We know you will like this one!
BLACKJACK II(*) - Play blackjack with a friend - on the telephone! We are first with remote games for the 99/4A
CALENDAR - On what day of the week will your birthday fall in 2001? In 1,000,000? This program explains our gregorian calendar system and will draw a calendar for any month of any year, even BC! It highlights the holidays and you can add your own special dates - permanently! Another BJF original!
MINIGOLF - 18 holes of miniature golf for 1 or 2 players. 64 different greens. No 2 consecutive holes or games are the same. Challenging and fun!
MINIGOLF II(*) - Play golf with a friend - on the telephone! A fine use for your comm gear!
XORKLE - A six-dice game for up to 6 players. A unique challenge to your daring and judgment! Can you throw a triple? If you XORKLE you've blown your turn! A BeeJay Funware original.
XORKLE II(*) - Play XORKLE on 2 home computers over the phone! Up to three players at each location.
(*) requires RS232 interface, modem & a fellow 99'er similarly equipped. Each player must have a copy of the program (order two). All programs require Extended Basic. Multiple programs furnished on same tape or disk.

******************** Prices ********************

1 PROGRAM...$12.95 2 PROGRAMS. . . .$16.95
4 PROGRAMS $21.95 PLEASE ADD $1.50 SHIPPING
Colorado residents please add 6.5% sales tax.

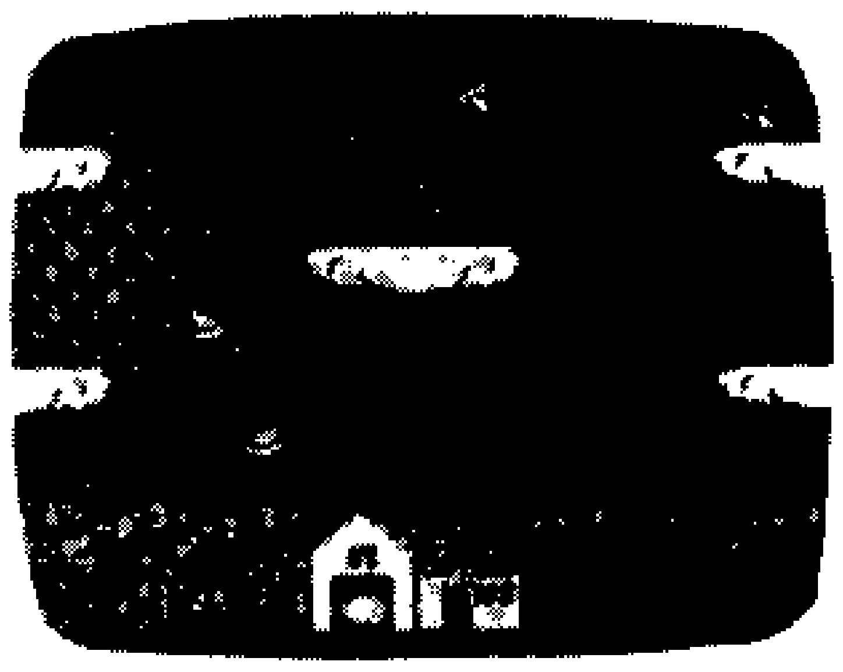
BeeJay FUNWARE
P.O. Box 27643
Denver, CO 80227
SATISFACTION GUARANTEED

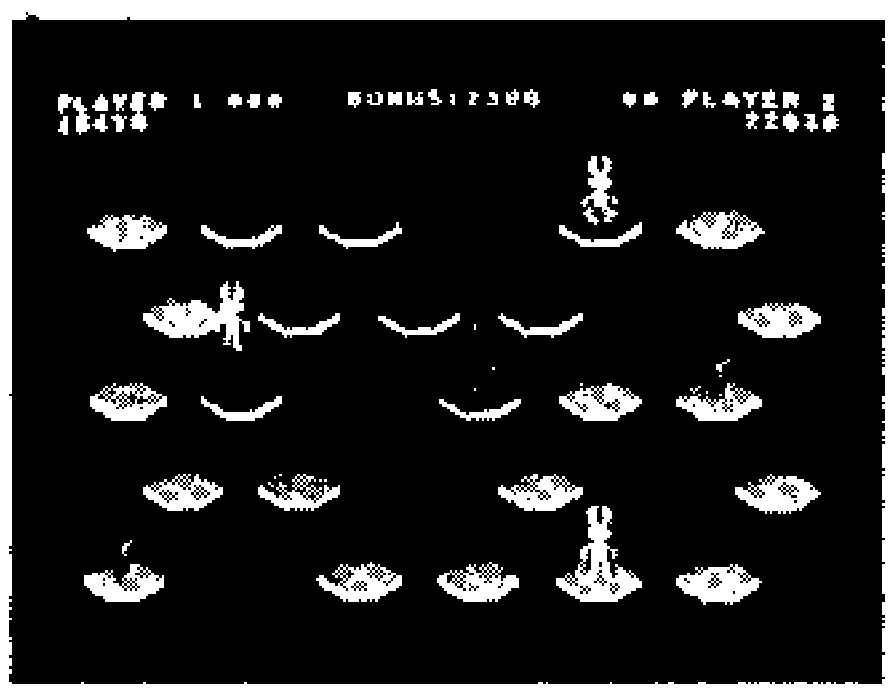
ROMOX™

CARTRIDGES FOR THE TI-99/4A

$37.50 ea. **$37.50 ea.**

IF YOU LIKE
"CHICKENS"
YOU'LL *LOVE*
"HEN PECKED"





IF YOU LIKE
"RABBITS"
YOU'LL *LOVE*
"TOPPER"

NEW

FOR YOUR TI-99/4A

WIDGIT—Cartridge Expander Board

A new "**WIDGIT**" cartridge expander board that lets you plug up to three TI-99/4A command modules. The "**WIDGIT**" comes complete with 3 sockets, a rotary switch and a button to reset the computer without turning power off and on.

The "**WIDGIT**" plugs directly into the "game slot" on the TI-99/4A console. It has a protective covering with rubber feet that will not scratch your console. Simply insert the "**WIDGIT**" into the game port, plug up to 3 command modules. Select your favorite cartridge with the rotary switch then press the reset button to re-start the computer.
Catalog number: WD-01

PRICE: $49.40 ea.

• **SPRITE EDITOR** *	**$29.95**
• **MUSIC EDITOR** *	**$29.95**
• **ASTROLOGY HOROSCOPE MAKE** *	**$49.95**

* EXTENDED BASIC required

This software requires 32K memory plus disk. Supplied on disk only.

MAIL TO
NAVARONE INDUSTRIES
510 Lawrence Expressway #800
Sunnyvale, California 94086

ORDERING INFORMATION

Please indicate the items you wish to order, the quantity, and the price of each item.

Send with a Cashier's check or M O (personal checks take an aditional 10 days to clear) NO credit cards. C.O.D.'s (add $5.00). Please allow 4 to 6 weeks for delivery

Add 5% of total order for shipping and handling. Cal residents add 6% sales tax.

DISK FIXER

This is a powerful Assembly language program written for those who want more control of the TI-99/4A.

The DISK FIXER is a utility program that acceses floppy disks by "SECTOR" rather than by file name. You can now display or print the actual contents of any sector of a floppy disk.

Other features of DISK FIXER allows you to change any byte on any sector or move data from one sector to another.

This tool is ideal for fixing blown directories, improperly closed files, and recovering data from diskettes otherwise inaccessable.

This program requires EDITOR ASSEMBLER, 32K memory expansion and a Disk drive.

Catalog number: AS-01 on diskette only

PRICE: $29.95 ea.

GROUP GRAPEVINE

Group Grapevine: News of TI Users Groups From Around the World.

A plea for help has come to us from a desperate W. Smythe of Ontario, Canada. Ms. or Mr. Smythe writes that he or she has recently been assigned the task of organizing a "programme. . . which will satisfy and stimulate the interest of a small but enthusiastic Users Group." Those of you with several successful meetings and agenda under your belts may wish to respond directly to the aforementioned W. Smythe at 22 Lavina Crescent, Leslie Park, Nepean, Ontario, K2H 7P2, Canada 830519.

Because Smythe notes in his/her letter that time is of the essence, we will try to oblige this urgent request for a "diversified programme" by here noting some tried and true ideas that have kept users groupies coming back for more.

1. Bring in a Celebrity. It can be both informative and inspiring to see how the experts design, program, debug and run their own software. For example, the **San Gabriel Valley 99/4 User's Group** recently had two professional programmers come in and share their graphics expertise. You can contact the group at 1008 Dore Street, West Covina, CA 91792.

2. Hold a Workshop. Many group newsletters include regular questionnaires for future workshop topics. **The Rocky Mountain 99'ers** (P.O. Box 3400, Littleton CO, 80161) is just one group who has held workshops on Extended BASIC and Assembly Language game programming.

3. Get Competitive. Contests for the best program, game or graphic design are a user group staple. A local computer dealer might even be persuaded to donate a prize. Recently the **Airport Area Computer Club** at P.O. Box 710, Coraopolis, PA 15108 initiated a masthead design contest to come up with a sharp new look for their newsletter.

4. Form Splinter Groups. This is an especially good idea for large groups with diverse interests and proficiency levels. **MUNCH, The Massachusetts Users of the Ninety-Nine and Computer Hobbyists** (1241 Main St., Worcester, MA 01603) has a separate beginners group, and many users groups form special interest groups to delve into such topics as Assembly Language, Computer-Assisted Instruction, and Game Designing.

5. Questions from the Floor. Communication is what users groups are all about. The **Cleveland Area 99/4A Computer Users Group** ends every meeting with an open forum during which members can pose questions, exchange information and offer suggestions. You can contact this group at 2385 Stanford Dr., Wickliffe, OH 44092.

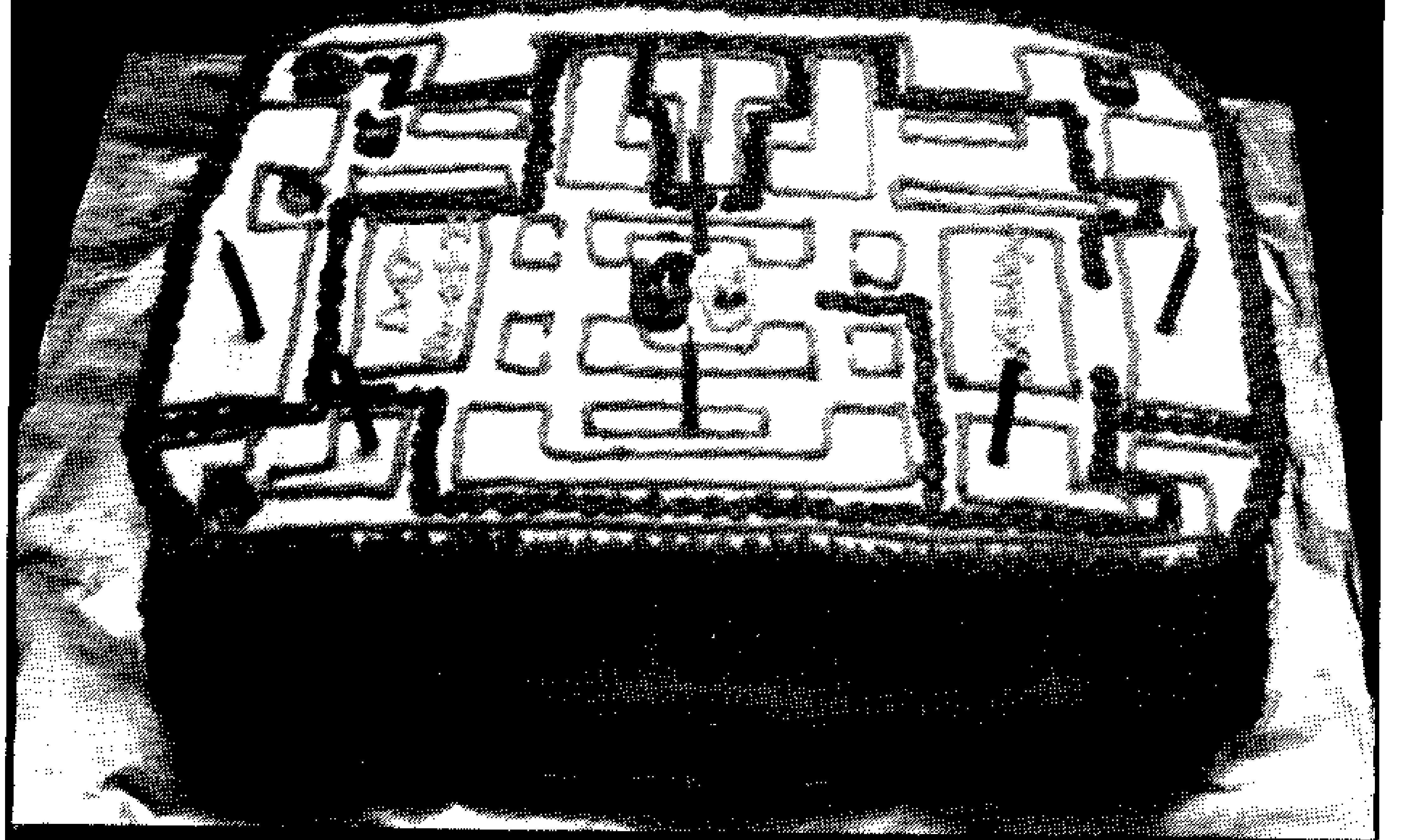
6. Start a Library. The **Central Texas 99/4A Users' Group** (P.O. Box 3026, Austin, TX 78764) is just one of many users groups that provide software libraries for the use of their members. Books and journals can also be shared.

7. Write to Us. Last but not least, send us a note or newsletter letting us know what you are up to. We'll try to print your name, address, appeals for members, entreaties for newsletters to exchange and any other news that's fit to print.

OK, W. Smythe, we expect to hear that your first meeting was a rousing success. Write about it to the **Users Group Editor, 99'er Home Computer Magazine, 1500 Valley River Drive, Suite 250, Eugene, OR 97401.**

Letters . . . from p. 7

"Let Them Munch Cake"



Dear Sir,

Recently my daughter Lauren celebrated her sixth birthday. Like all kids her age she wanted a cake which depicted her favorite thing, in this case MUNCHMAN! My very talented friend, Bob Gwinn (also a 99/4A enthusiast) offered to do the baking and decorating. We thought you might like to see the results. We think many of your readers might like to try to create other theme cakes for their kids—next year PARSEC!

Dee Urban
Orchard Park, NY

Dear Sir:

I was wondering if any of your readers could take the time to help me with some "Call Sounds" that I don't know how to do. I need the sounds for a game I am making based on the game by Williams Electronics called "Joust." Besides these sounds I am interested in learning how to make a variety of sounds other than musical sounds.

Ty Morrison
Riverside, CA

A previous issue of 99'er HCM will give you some good tips on the production of musical and non-musical sounds using the CALL SOUND subprogram, Ty. Livening Up Your CALL SOUNDS in Volume 1, Number 6 (the last issue before 99'er went monthly) provides a guide to the production of a variety of sounds: bees, teleprinters, sword clashes, footsteps, sirens . . . We still have a few copies of that back issue in our warehouse, but the supply is limited.

Dear Sir:

In the May 1983 issue Greg Roberts states in his article "From Cut & Paste to Keystroke" that it would cost from $50 to $1000 to bring a TI-99/4A up to word processing status. From the price list I have from Texas Instruments for the equipment required, as listed in the article "Word Processor Market Basket," it would cost me over $2200 to achieve word process status since all I have is the TI-99/4A, TV and cassette recorder. What accounts for the significant difference?

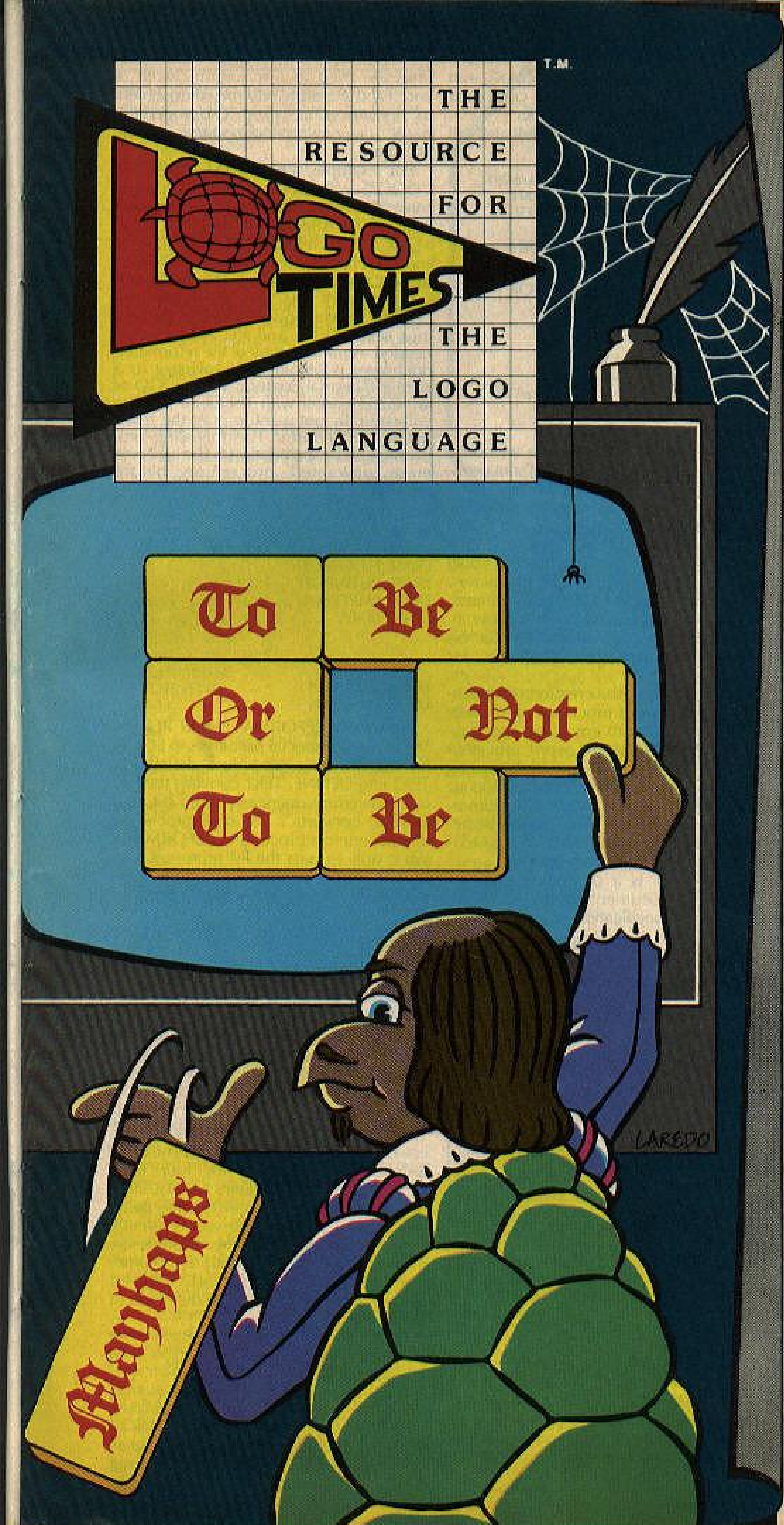
Melvin Fields
Aptos, CA

The possible prices depend on a number of things, Melvin. In your case, for instance, the biggest expense would be the hardware components necessary to communicate with a printer, plus the printer itself. Several manufacturers besides TI produce the hardware interfaces, with various capabilities and at various prices. One manufacturer (Model Masters) produces an inexpensive RS232 interface that uses the joystick port. If you want to build your own RS232 interface through the joystick port, the June and July issues of 99'er HCM gave you the plans and software (JoyTalk Is Cheap). For both of these devices, TI's Mini Memory Cartridge is required.

The cost of a printer depends on your particular needs. If a no-frills, low-speed dot-matrix impact printer will satisfy your needs, you'll be able to get away with a minimal outlay. And if a plain-paper printout is not mandatory, you might consider a full-feature thermal printer. In this issue (Peripheral Visions, p. 41), we review an 80-column $200 thermal printer, for instance. If you want correspondence-quality printing, expect to lay out a good deal more. Printer speed, software options, paper size and type, among other things, will affect the cost of your word processing system.

Then there's the question of software. The cost here can range from free to substantial. Tex-Scribe (December, 1982 issue of 99'er HCM) only costs the time and effort to key it in. There are also inexpensive software packages that will run on minimal systems. And there soon will be a cassette-based version of TI's word processing software for use with the Mini Memory cartridge (TI-Mini-Writer, announced for third quarter, 1983). If these systems are too limited in scope for your particular needs, then there are third-party software packages (advertised in this magazine) of varying degrees of complexity—running all the way up to TI's own package, TI-WRITER.

In other words, how much you might spend depends on the present state of your system, your projected needs and your ability to shop around and find the best prices for hardware and software.


T.M.
THE RESOURCE FOR THE LOGO LANGUAGE
LOGO TIMES
To Be Or Not To Be
Mayhaps
LAREDO

TURTLE TEXT

A Response to Muller's Challenge

By Roger B. Kirchner

Last month we published Roger Kirchner's reply to the third of Jim Muller's challenges, that someone write a multi-colored tessellation procedure for TI LOGO to graphically represent multiple depths of recursion. [You may remember that Muller, President of the Young People's LOGO Association, asked other champions of LOGO to come forward with solutions to the problems he posed in order to answer what both he and Kirchner felt were unfair criticisms to the effect that LOGO is somehow deficient.—Ed.] Those of you who saw last month's "Mosaic Designs" know how spectacularly TI LOGO was defended on that count. This month Roger Kirchner responds to the first of Muller's challenges, that a LOGO proponent "write TI LOGO procedures that perform word-processing functions on either a 40- or 80-column screen and printout in 40 or 80 columns." We think you'll agree that Kirchner ably defends LOGO in this instance too, and we're hoping that he—or someone—will soon complete LOGO's exoneration with "an interactive graphics program that includes file access features."

By word processing we will mean the creation and formating for output of a text document such as a letter. As those of you who've worked with TI's word processor TI-Writer know, having a screen with fewer than 80 columns is no limitation in the preparation of well-formated output. What is important are good screen editing commands and the ability to easily format text for output to any given specifications.

Documents are most easily created by using the built-in TI LOGO editor. Since we are primarily interested in printing the documents we create, and since TI LOGO can print only procedure definitions, the trick is to make LOGO think we are defining a procedure. The first line must therefore be TO *procedure-name*, where *procedure-name* is a name for our document, and the last line must be END. Edit mode can be entered by entering either EDIT, or TO *procedure-name*. When BACK is pressed, a procedure will be created with the name *procedure-name*, with the text we have entered as body.

TI LOGO's editor has excellent screen editing commands: Keys move the cursor up or down by lines (UP, DOWN), or within a line forward or back one space (LEFT, RIGHT), or to the beginning or end of the line (BEGIN, PROCEED). The character either under the cursor or behind the cursor can be deleted (DEL, ERASE). Text from the cursor to the end

THE RESOURCE FOR THE LOGO LANGUAGE

LOGO TIMES™

Introduction

LOGO Times is an information resource for anyone interested in participating in the creation of their own *personal* language—one that will easily allow them to communicate with a computer in a totally new audiovisual realm of applied imagination, exploration, and self-discovery. The articles on these pages concern the use of the new TI LOGO language, but readers do *not* need any additional software or equipment (or even a computer) to understand and learn from the material presented here.

If readers want to actually *experience* a TI LOGO environment, they will need either a TI-99/4 or TI-99/4A computer, the Expansion Memory peripheral, and TI LOGO Command Cartridge. A disk drive, although convenient to have, is *not* required; a user's work may alternately be saved on cassette tape, printed out on the TI Thermal Printer, or hand copied into a notebook (for later re-keyboarding).

In each issue, one or more of the articles may reference or build upon the topics discussed in a previous article. It is therefore recommended that for maximum benefit and understanding, new readers obtain the appropriate back issues of *99'er Home Computer Magazine* containing *LOGO Times* articles.

NOTICE

LOGO Times is actively soliciting articles. Manuscripts should be typed double-spaced, and accompanied by a cassette tape or disk if containing any lengthy procedures or graphics.

Send all materials to:

LOGO Times Editorial Dept.
99'er Home Computer Magazine
1500 Valley River Dr., Suite 250
Eugene, OR 97401

All mail directed to the Letters-to-the-Editor column (*Letters on LOGO*) will be published in accordance with the conditions set forth on *99'er Home Computer Magazine's* Masthead page.

Our Contributing Editors

Henry Gorman, Jr.
Department of Psychology
Austin College
Box 1584
Sherman, TX 75090

Roger B. Kirchner
Department of Mathematics
Carleton College
Northfield, MN 55057

William M. Goodman
7 Vanier Drive, No. 502
Guelph, Ontario
Canada N1G 2L1

LOGO Times is a trademark of
Emerald Valley Publishing Co.

---

of the line can be deleted (CLEAR), and lines can be inserted, split, or combined by entering or deleting ENTERs.

Let's write a sample document and call it DOC:

```
THE NUMBER OF SCREEN COLUMNS
ISN'T PARTICULARLY IMPORTANT
IN TEXT PROCESSING. HOWEVER,
IT IS VERY IMPORTANT TO BE
ABLE TO FORMAT OUTPUT FOR A
GIVEN WIDTH LINE.

REFORMAT IS A PROCEDURE FOR
REFORMATING OTHER
PROCEDURES. ITS INPUTS ARE
THE OLD NAME,
THE LINE WIDTH, AND THE
NEW NAME.
THE NEW NAME CAN BE THE SAME
AS THE OLD NAME.
END
```

When we type in EDIT mode, we notice that we can continue typing without pressing ENTER until 127 characters have been entered. The text will simply wrap around. Words will be split arbitrarily, but that is a problem only at the output stage. In the example the lines are short, but they could have been as long as 127 characters. Notice too, that we have not indented. This is because LOGO doesn't allow indenting in procedure definitions (unless we use a non-space character for indenting).

Besides making the creation of a document easy, a word processor must make possible a format to any given specification for printing. A full word processor such as TI-Writer allows much formating flexibility. But because Muller's challenge is to format output to 40 or 80 columns, our main concern in TI LOGO will be formating the width. TI-Writer, of course, is not limited to those two options.

REFORMAT is a procedure that will reformat a document to any width we choose. Its specification is:

REFORMAT *oldprocedure-name width newprocedure-name*. This reformats document *oldprocedure-name* so that lines are filled to a maximum width of *width* and stores the reformated document as *newprocedure-name*. *Oldprocedure-name* and *newprocedure-name* can be the same.

For example, REFORMAT "DOC 25 "DOC25 will reformat DOC to have at most 25-character lines and store the result as DOC25. And REFORMAT "DOC 60 "DOC60 will reformat DOC to have at most 60-character lines and store the result as DOC60. The results are seen in figure 1.

REFORMAT also uses the other procedures listed below. These can be kept in a separate file and RECALLed when needed. A printed copy of the reformated document is obtained by saving it to a printer (Thermal Printer with TI LOGO or an RS232 printer with TI LOGO II). One will naturally not want to print the reformating procedures. The following procedure can be included with the others to erase unwanted procedures before printing:

```
TO CLEANUP
ERASE REFORMAT
ERASE REFORMAT1
ERASE FLUSHBUFF
ERASE PUTINBUFF
ERASE EMPTYBUFF
ERASE TENW



ERASE CLEANUP
END
```

How does REFORMAT work? REFORMAT uses the special primitives in LOGO for manipulating procedure definitions: TEXT and DEFINE. TEXT converts the text of a procedure definition into a list, and DEFINE converts a list of a procedure definition into a procedure. REFORMAT'S job is only to pass the list representation of the input procedure definition to REFORMAT1 and to take the output of REFORMAT1 and convert it to a procedure with the name provided. The main work is done by REFORMAT1. The definition for REFORMAT is:

```
TO REFORMAT :TNAME :LL :NTNAME
MAKE "T TEXT :TNAME

MAKE "T REFORMAT1 :T :LL [ ] [ ] 0 [ ]
DEFINE :NTNAME :T
MAKE "T [ ]
END
```

There are six inputs to REFORMAT1. The first two are the list of lines to be processed and the desired line width. The other four are initial values for four local variables. The local variables are 1) :CURL, the list of words in the current line being processed, 2) :BUFF, the words already processed for the next line of the reformated text, 3) :BL, the width of the processed text in :BUFF, and 4) :NEXT, the list of lines processed so far. The definition of REFORMAT1 is:

Figure 1.

```
TO DOC25

THE NUMBER OF SCREEN
COLUMNS ISN'T
PARTICULARLY IMPORTANT IN
TEXT PROCESSING. HOWEVER,
IT IS VERY IMPORTANT TO
BE ABLE TO FORMAT OUTPUT
FOR A GIVEN WIDTH LINE.

REFORMAT IS A PROCEDURE
FOR REFORMATING OTHER
PROCEDURES. ITS INPUTS
ARE THE OLD NAME, THE
LINE WIDTH, AND THE NEW
NAME. THE NEW NAME CAN BE
THE SAME AS THE OLD NAME.
END

TO DOC60

THE NUMBER OF SCREEN COLUMNS ISN'T PARTICULARLY IMPORTANT IN
TEXT PROCESSING. HOWEVER, IT IS VERY IMPORTANT TO BE ABLE TO
FORMAT OUTPUT FOR A GIVEN WIDTH LINE.

REFORMAT IS A PROCEDURE FOR REFORMATING OTHER PROCEDURES.
ITS INPUTS ARE THE OLD NAME, THE LINE WIDTH, AND THE NEW
NAME. THE NEW NAME CAN BE THE SAME AS THE OLD NAME.
END
```

BLACK GOLD—TRY YOUR LUCK IN THE OIL BUSINESS AND STOCK MARKET. SEE IF YOU CAN BECOME A MEMBER OF THE IDLE-RICH. FOR 1-4 PLAYERS, HIGH-RES GRAPHICS, AND SOUND EFFECTS.
EXT-BASIC **$19.00**

RAT RACE—GET YOUR RAT ACROSS A BUSY FREEWAY WITHOUT GETTING RUN OVER. MULTI LEVEL AND FILLED WITH EXCITEMENT AND SURPRISE. EXT-BASIC, JOYSTICKS, OR KEY BOARD **$16.00**

BLACKJACK—VEGAS STYLE. YOU CAN DOUBLE DOWN, SPLIT ON PAIRS, AND INSURANCE. START YOUR BANK ROLL AND BET AS YOU WISH. HIGH RES. GRAPHICS AND SOUND IN EXT-BASIC for 1-4 PLAYERS. **$11.00**

AVAILABLE ONLY ON CASSETTE
SEND CHECK OR MONEY ORDER TO:

CHARLES S. HENDERSON
806 BARRETT ST.
RICHMOND, TEXAS 77469
DEALER INQUIRIES INVITED.

PROGRAMS SOFTWARE

AFFORDABLE SOFTWARE

Programs for your TI-99/4A
16K Machine, in basic
and extended basic, on
cassette tape.

CATALOG $1.00

Programs Software
1435 Burnley Sq. N.
Columbus, Ohio 43229

QUALITY SOFTWARE

DR. ELIZA
Tell the Doctor your troubles. A new version of this artificial intelligence program improved by a psychiatrist.----------------$15.95

BIORYHYTHM
Predict your highs and lows. Print on screen or use your printer.----------------------------$5.95

SUPERTREK
Can you save the Federation? Best sound effects on the market! Color graphics.----$9.95

SPACE BATTLE
Manuever, aim, and fire at your opponent's space ship. A fast action arcade style game for 2 players. Ext Basic; joysticks opt. $9.95

SEND POSTCARD FOR FREE CATALOG OF ADDITIONAL PROGRAMS.

ALL PROGRAMS ON CASSETTE; FOR DISKETTE VERSION ADD $3.00
SEND CHECK, MONEY ORDER, OR VISA/MC NUMBER AND EXP. DATE
FREE SHIPPING IN THE U.S.
PA RESIDENTS ADD 6% SALES TAX.

SOFT-TEX
TI 99/4(A) SOFTWARE
3 WALNUT LANE
BERWYN, PA 19312
(215)-293-1790

```
TO REFORMAT1 :TXT :LL :CURL :BUFF :BL
:NTXT
1:
IF :CURL = [ ] THEN GO "2
MAKE "W FIRST :CURL
MAKE "WL LENW :W
TEST :BL + :WL > :LL
IFT FLUSHBUFF
IFF PUTINBUFF
GO "1
2:
IF :TXT = [ ] THEN EMPTYBUFF OUTPUT
:NTXT
MAKE "CURL FIRST :TXT
TEST :CURL = [ ]
IFT EMPTYBUFF FLUSHBUFF
MAKE "TXT BF :TXT
GO "1
END
```

The idea is to consider lines of :TXT one at a time. The next line is made the value of CURL. The words in :CURL are put one at a time into :BUFF (with PUTINBUFF) until the length of :BUFF would exceed :LL. Then FLUSHBUFF empties :BUFF, storing its contents as a list at the end of :NTXT. An empty line in :TXT is understood to be a space between paragraphs. Then anything in :BUFF is removed to :NTXT by EMPTYBUFF, and FLUSHBUFF adds an empty line at the end of the :NTXT. Both EMPTYBUFF and FLUSHBUFF use the primitive LPUT which puts a list at the end of another list.

It must be admitted that although these procedures work, they are suitable only for short documents. I had some trouble with TI LOGO "choking" on longer documents. TI LOGO II should work much better because of its much larger workspace.

REFORMAT proves that text formating can be done in TI LOGO and that it can produce good-looking printed output. If you want to use a more flexible word processor, go into a procedure-oriented language having greater control over output—TI Extended BASIC, Pascal, or FORTH, for instance. But LOGO is a good language for thinking through solutions to problems, a language for learning—even about word processing.

LISTINGS OF THE REFORMAT PROCEDURES

```
TO REFORMAT :TNAME :LL :NTNAME
MAKE "T TEXT :TNAME

MAKE "T REFORMAT1 :T :LL [ ] [ ] 0 [ ]
DEFINE :NTNAME :T
MAKE "T [ ]
END

TO EMPTYBUFF
IF :BUFF = [ ] THEN STOP
PRINT :BUFF
MAKE "NTXT LPUT :BUFF :NTXT
MAKE "BUFF [ ]
MAKE "BL 0
END

TO REFORMAT1 :TXT :LL :CURL :BUFF :BL
:NTXT
1:
IF :CURL = [ ] THEN GO "2
MAKE "W FIRST :CURL
MAKE "WL LENW :W
TEST :BL + :WL > :LL
IFT FLUSHBUFF
IFF PUTINBUFF
GO "1
2:
IF :TXT     [ ] THEN EMPTYBUFF OUTPUT
:NTXT
MAKE "CURL FIRST :TXT
TEST :CURL = [ ]
IFT EMPTYBUFF FLUSHBUFF
MAKE "TXT BF :TXT
GO "1
END

TO PUTINBUFF
MAKE "BUFF SE :BUFF :W
MAKE "BL 'BL + :TXT
GO "1
END

TO FLUSHBUFF
PRINT :BUFF
MAKE "NTXT LPUT :BUFF :NTXT
MAKE "BUFF [ ]
MAKE "BL 0
END

TO LENW :W
IF FIRST :W = :W THEN OUTPUT 1
OUTPUT 1 + LENW BF :W
END
```

MYSTERY
CONTEST

Another Parisian is missing, only this time it is Pierre Riche, son of the famous industrialist Roberto Riche, who has commissioned you . . . Inspector Hew Dunnit, to find his son for a substantial *REWARD*!!!

FIRST PRIZE: Your choice of a TI Speech Synthesizer or a Signalman Mark III Telephone Modem.

TEN SECOND PRIZES: $75.00 in quality software from Instrumental Software Systems, Inc.

Follow Inspector Hew Dunnit in this adventure mystery through a spine-tingling trek around the world in his attempt to locate the Phantom of Blackmoore. If you are an adventure player, a game player, or just love a good mystery . . . THEN ENTER NOW!!!

OFFICIAL RULES

1. For your copy of "The Phantom of Blackmoore" send a check or money order for the special contest price of $5.95 for cassette, (specify basic or x-basic) or $8.95 for Disc to: Instrumental Software Systems, Incorporated 311 Maple Street, Danvers, Massachusetts 01923 Enclose your name and address.

2. All entries must be postmarked no later than Sept. 15, 1983. All programs will be mailed two to three weeks after the entry date to ensure a fair start for all.

3. Each solution must be mailed to us with the correct answer to the mystery and the individual code number that will be displayed by your computer when the mystery is solved.

4. Prizes will be awarded to those solutions that are received by us first. In case of a tie, the winners will be drawn at random.

5. In the case where your cassette or disc will not load or run, it may be returned in its original condition, within ten days of our mailing date for a full refund.

6. We cannot be responsible for lost, damaged, or illegible entries. All entrants agree to be bound by the official rules and Instrumental Software Systems Inc. shall have no liability other than stated therein.

State of the Art Software

Utilities I
RING DESTROYER
INTERCEPTOR
REPUBLIC SOFTWARE

Four Software Utilities for the Texas Instruments 99/4 or 99/4A Home Computer.

Includes.

DISASSEMBLER— executes in Extended BASIC or in console BASIC if the Mini-Memory or Editor/Assembler is available.

POINT-PLOTTING ROUTINES— high-resolution plotting capability in console BASIC, Extended BASIC, and Assembly Language.

SCREEN DUMP ROUTINES— written in console BASIC, Extended BASIC, and Assembly Language for the TI 80-column printer and Epson Printers with Graftrax or Graftrax Plus.

SPEECH UTILITY— allows the speech synthesizer to speak *any* word you wish in your Extended BASIC programs without TI's Terminal Emulator II or Text-to-Speech programs

A fast-action space game for the Texas Instruments 99/4 or 99/4A home computer. Requires Extended BASIC and **either** Joysticks (for execution in Extended BASIC) or Expansion RAM (for execution in Machine Language).

As the number of software packages available for the Texas Instruments 99/4 and 99/4A has grown to more than 1000, why have **REPUBLIC SOFTWARE** entertainment and utility products remained so popular? Because **REPUBLIC** gives you the high-quality software you've been looking for—and much more.

All **REPUBLIC SOFTWARE** products have the unique ability to adapt themselves to your computer system's capabilities as your system grows. Each package will execute on a cassette-based console BASIC system (RING DESTROYER requires Extended BASIC), but each program also includes versions or options to take advantage of the greater speed or capability of such additional equipment as Joysticks, Assembly Language, Extended BASIC, disk drives, the Expansion RAM, the speech synthesizer, or the RS232 interface and compatible printer. For trouble-free loading, **REPUBLIC SOFTWARE** programs are recorded on high-quality cassettes or disks produced by such manufacturers as TDK, Scotch, and Wabash. And each **REPUBLIC SOFTWARE** program is accompanied by a clearly-written, detailed instruction manual printed (not photocopied) on materials that will last.

So, for the best in software value, see your dealer or order directly from **REPUBLIC.** RING DESTROYER, UTILITIES I, and INTERCEPTOR are each available for $19.95. Please specify disk or cassette.

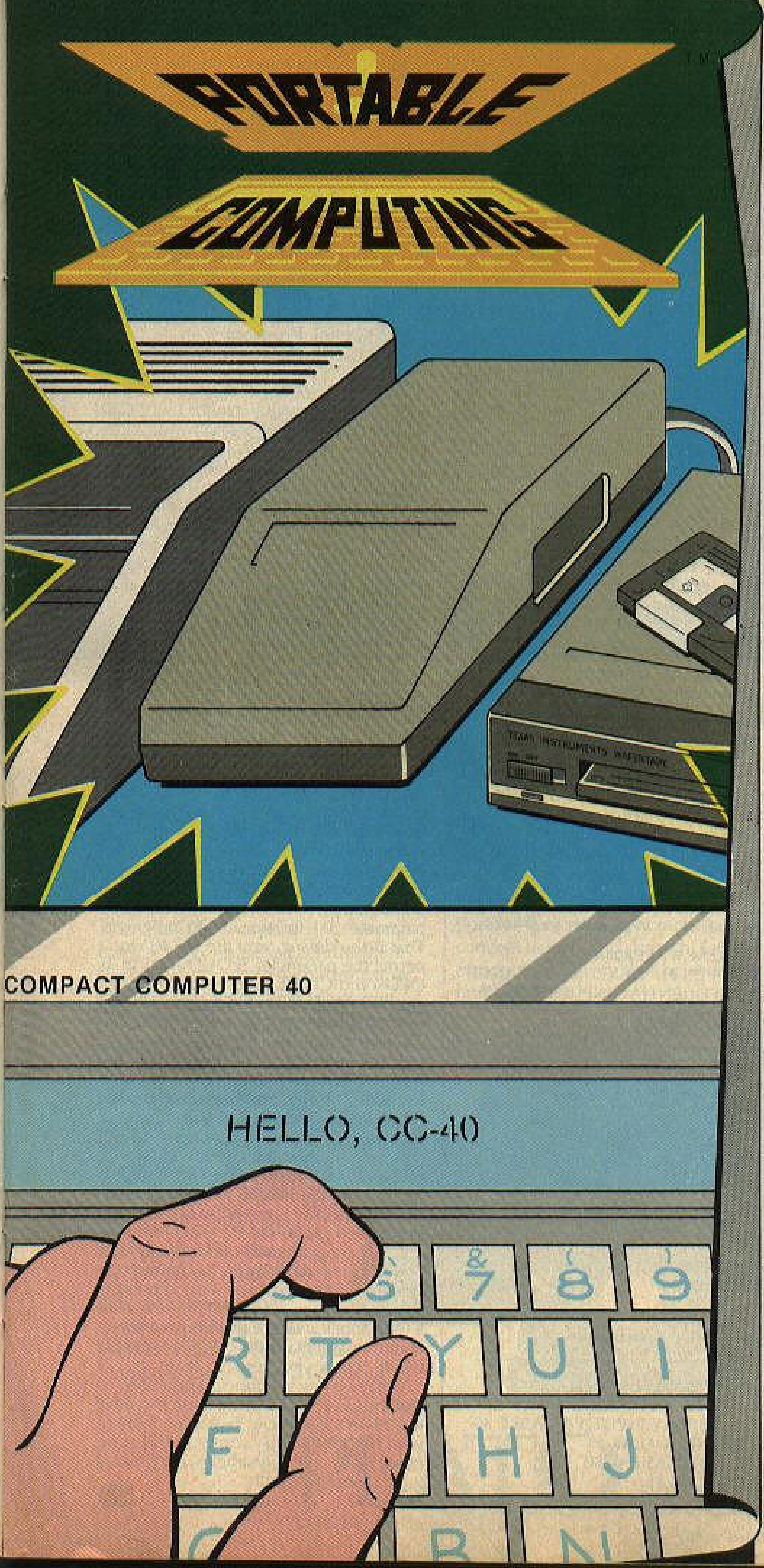
Buy Now and Save!

Phone (202) 978-3554 to place your order and we will reduce the price by $2.00 to pay for the call. VISA and MasterCard welcome. To better serve our customers in all time zones, our hours have been changed to 1 to 8 PM EDT, Monday through Friday.

PO Box 23042 • L'Enfant Plaza
Washington, DC 20024

REPUBLIC SOFTWARE

MasterCard OR VISA



HELLO, LITTLE BROTHER!

By Robert Ackerman

Technical Editor

With the Compact Computer 40, Texas Instruments introduced a new communications interface, the Hex-bus™ Intelligent Peripheral Interface. Devices that make up the CC-40 system communicate with each other through the Hex-bus interface. Since the Hex-bus interface is entirely different from the peripheral interface of the 99/4A, this would seem to preclude any communication between the two systems. Such is not the case, however. TI has developed another peripheral for the 99/4A, the Hex-bus adapter, which we recently saw at the Consumer Electronics Show, and had a chance to "test drive" (along with other of the soon-to-be-released compact peripherals) on a subsequent trip to Lubbock. This device allows the 99/4A to talk to the Compact Computer system.

Consider an engineer or surveyor, for instance, who needs to record raw data in the field. He might like the portability of the CC-40 and its peripherals. To process the data and display the results most advantageously, however, the computing power, capacity or convenience of the 99/4A system might be useful. Now the best of both worlds is available.

There are several ways to communicate between the systems. Here we'll examine a method whereby TI's Wafertape™ drive acts as the intermediary.

The Hex-bus Adapter

The device used to connect these two worlds is the Hex-bus Adapter. It is like one of the old "freight-train" peripherals: It plugs into the accessory connector on the right side of the 99/4A computer console. (The cable to the 99/4A's Peripheral Expansion System can then plug into it—hence the "freight-train" nickname.) It is relatively small (8 x 3 1/2 x 2 inches), so it doesn't take up much room. This device serves two functions: It passes signals through to the Peripheral Expansion System (PES), or it passes signals to the Hex-bus peripherals. When it's used to communicate with the Hex-bus system, the adapter requires its own power source. It has a connector in the back for the output from a 6-volt transformer. It will, however, continue to pass signals to the PES without power. It's only when it has to tap the PES bus and pass signals to the Hex-bus that it must be powered up.

With the adapter in place, the commands or statements to access the PES peripherals are exactly the same as before. In order to access the Hex-bus system, however, the *device* is HEXBUS. This is then followed by the designations used in the Hex-bus system. In this system, all devices have a single number designation only, rather than an alphanumeric designation like DSK1 or CS1. For instance, the first Wafertape drive is called simply 1. So to save a program from Extended BASIC on the 99/4A to Wafertape drive 1, the command would be SAVE HEXBUS.1.*filename*. Because the CC-40 has only the Hex-bus interface, HEXBUS is superfluous. The command to save a file to the first Wafertape drive from the CC-40 is simply SAVE 1.*filename*.

The Wafertape Drive

The wafertape recording medium itself is an endless strip of magnetic tape, and it always passes across the read/write heads in one direction only. In order for the drive to orient itself with regard to the tape, the tape has a reflective marker that serves as the end-of-tape and beginning-of-tape marker. When the drive needs to find this marker, which is its base reference point, this intelligent peripheral automatically advances the tape until the beginning-of-tape marker passes the read/write heads. From the information on the tape's directory, which is recorded immediately after the beginning-of-tape marker, the drive can then determine where any file on the tape is located and automatically advance to that location.

But even though finding a file requires only a single keyboard operation (and no reading of cassette footage counters, skipped commands in the cassette loading operation, etc.) to find a file, the Wafertape drives are not much faster than the cassette in actual tape transport. It takes about 15 seconds for a 10-foot tape to reach any location on the tape; it takes about a minute and a half on a 50-foot tape. In other words, it seems like an eternity for a 50-foot tape to find the beginning-of-tape marker again. The choice of wafertape involves a trade-off, just as the speed of flying may mean long waits at airports and time-consuming trips to and from downtown.

Physically, the Wafertape drive is much more convenient than a cassette drive. For one thing, it is much smaller—approximately 6 x 4 1/2 x 1 1/2 inches, or about the size of a ham sandwich. The tapes themselves are also smaller: about half the size of a cassette in any dimension. In addition, the Wafertape drive runs from the power of four penlight batteries or from a 6-volt transformer. This minimal power requirement—coupled with its size— means that it's perfectly portable.

File Management on Wafertape

The hybrid parentage of the Wafertape influences its file management system. It has the organizational structure of a diskette—a directory with physical locations indicated on it—along with the physical structure of a cassette tape—a long strip of magnetic medium. The directory after the beginning-of-tape marker contains all the information about the location of the files on the tape. But the physical structure of the tape, coupled with the one-way operation of the drive, dictates that all files be sequential rather than relative—you can't back the tape up.

In addition, files are added to the tape in line, one behind the other. This has consequences for the uses of certain files, as well, according to the preliminary manual for the Wafertape drive. A tape can hold up to sixteen files, but the only one which can be closed and then reopened for output is the last one. Reopening any other file—that is to say, one somewhere in the middle of the tape—for output will cause the system to delete its present directory entry. It will then add a new directory entry which puts the reopened file at the end of the tape. In that case, the previous contents of the file are lost. This means that when you use wafertape to store a file which you will continually be updating—that is, outputting to and inputting from—it *must* be the last file on the tape. Or the *only* file on the tape.

The process of setting up a wafertape for use is called formating, and is similiar to initializing a diskette. From the CC-40, the operation is extremely simple: You put a tape in the drive and type the command FORMAT, followed by a space and the number of the drive. Typing FORMAT 1 and pressing [ENTER] establishes the directory at the head of the tape on Wafertape drive 1. To format a wafertape from the 99-4A requires a slightly different procedure. You will have to run the following miniprogram:

```
100 OPEN #1:"HEXBUS.FORMAT
      MEDIA.1"
110 CLOSE #1
120 END
```

(Note the space between FORMAT and MEDIA.) This accesses Wafertape drive 1 through the Hex-bus Adapter and sets up the directory on the tape. In both cases, the use of the FORMAT command is analogous to initializing a diskette: All previous data on the medium is wiped out.

Listing 1

(Output from 99/4A to Wafertape):

```
100 REM 4A2WAFER
110 OPEN #1:"HEXBUS.1.XCHANGE",
      SEQUENTIAL,OUTPUT,DISPLAY,
      VARIABLE 80
120 CALL CLEAR
130 LINPUT "MESSAGE?":A$
140 PRINT #1:A$
150 CLOSE #1
160 END
```

Listing 2

(Input from Wafertape to 99/4A):

```
100 REM WAFER24A
110 OPEN #1:"HEXBUS.1.XCHANGE",
      SEQUENTIAL,INPUT,DISPLAY,
      VARIABLE 80
120 CALL CLEAR
130 LINPUT #1:A$
140 PRINT A$
150 CLOSE #1
160 END
```

Listing 3

(Output from CC-40 to Wafertape):

```
100 REM CC402WAFER
110 OPEN #1,"1.XCHANGE",
      DISPLAY,OUTPUT,VARIABLE 80
120 LINPUT "MESSAGE?";A$
130 PRINT #1,A$
140 CLOSE #1
150 END
```

Listing 4

(Input from Wafertape to CC-40):

```
100 REM WAFER2CC40
110 OPEN #1,"1.XCHANGE",
      DISPLAY,INPUT,VARIABLE 80
120 LINPUT #1,A$
130 PRINT A$:PAUSE
140 CLOSE #1
150 END
```

The Transfer Program

Now that you can format tapes from either system, the next step is to use them. While in Lubbock, we wrote and tested a series of short programs for the CC-40 and the 99/4A. These programs will allow you to: 1) write to the Wafertape from the 99/4A; 2) read from the Wafertape to the 99-4A; 3) write to the Wafertape from the CC-40; and 4) read from the Wafertape to the CC-40. Listings 1 and 2 are in Extended BASIC, which requires the Extended BASIC cartridge for the 99/4A; Listings 3 and 4 are in Enhanced BASIC, the resident language of the CC-40. These programs permit the the Wafertape drive to serve as an intermediary between the two systems. They are merely skeletons, which will get fleshed out for more comprehensive use in subsequent articles.

All the programs either create or look for a file called XCHANGE, and either write a string to or read a string from the file. Since the internal formats of the two computers are different, the file data type is DISPLAY, because DISPLAY codes the information in one of the universal standards: ASCII code. The length for all the files is common: VARIABLE 80. The files are, of course, SEQUENTIAL. You'll notice that SEQUENTIAL is not included in the parameter list for the CC-40 programs. That is the default, and the CC-40 won't permit the parameter SEQUENTIAL in its OPEN and CLOSE statements which access the Wafertape. Oddly enough, including it in the parameter list gives you a syntax error.

You'll notice some other syntax differences between statements in the two BASICs. The file numbers in Extended BASIC OPEN and LINPUT statements are followed by colons; in Enhanced BASIC, it's commas. And the command to print to the CC-40's display (line 130, Listing 4) has to have the PAUSE statement; otherwise, the display is erased so fast that you don't even get to see it.

These programs will undoubtedly start you thinking about ways to use the two systems together when all the components finally reach your dealer's shelves. With a few modifications, expansions, or alterations they will make the the 99/4A and the CC-40 into a very versatile team.

What we saw in Lubbock suggests to us that the CC-40 alone might be able to drive the 99/4A's Peripheral Expansion System, which opens up some interesting possibilities. In future articles, we'll take a look at this potential.

PLATO EDUCATIONAL COURSEWARE BRINGS NEW EXCITEMENT TO LEARNING.

If your kids think serious education has to be dull, wait until they use Control Data PLATO® educational courseware.

With PLATO courseware, children can learn by competing against themselves; by interacting with stimulating graphics that keep them motivated. They see their progress, and find real excitement in achievement.

PLATO courseware is being used in classrooms across the nation. Now you can bring this quality education home. You'll find PLATO lessons at selected retail outlets where quality software is sold.

For the Apple II Plus and Apple IIe, the TI 99/4A or Atari 800.

The selection includes elementary Math lessons in Basic Number Facts, Whole Numbers, Decimals and Fractions.

Through such computerized activities as "darts" and "pinball," PLATO makes learning math almost fun.

Foreign Language lessons use the popular hangman or pyramid game concept to help teach French, German or Spanish in a way that holds and builds interest.

PLATO
Decimals
Spanish
Computer Literacy: Introduction

Our Computer Literacy lesson provides a perfect introduction to the computer age for kids and novices.

For Apple II Plus and Apple IIe.

Our Keyboarding lesson shows children and adults how to use a keyboard to enter data into the computer. Developed in cooperation with Gregg-McGraw Hill.

Widen your child's world.

See the growing library of PLATO educational courseware at selected retail outlets. Or for information and a free PLATO educational courseware catalog, call toll-free 800/233-3784. Or write: Control Data Publishing Co., P.O. Box 261127, San Diego, CA 92126. In California call 800/233-3785.

Warranty available free from Control Data Publishing Co., 4455 Eastgate Mall, San Diego, CA 92121

PLATO
COMPUTER-BASED EDUCATION

CONTROL DATA
PUBLISHING

PLATO'S
PROGRESS

A Classic

It's official! PLATO, that bearded Greek philosopher and symbol of learning has emerged from behind the pillars of the Academy and is now using the Home Computer to impart his ideals to all who will gather 'round his console.

Back in January of this year we introduced you to Control Data's PLATO and their concept of a living library of learning. At that time, PLATO was only for the few in government, big businesses and universities who could afford the output of large, expensive computers. Now, we will be able to let you share in our regular audiences with this knowlegeable master. We will use this space to keep you up to date on what's happening in PLATO's realm and beyond.

Our big news this month is that PLATO, the CAI curriculum of 108 courses, is now available to TI Home Computer owners! All you need in the way of hardware to help you become an enlightened PLATOnic scholar is:

- a TI-99/4A Home Computer
- a Disk Memory system
- Memory Expansion.

Add to this the PLATO firmware (PLATO Interpreter Solid State Cartridge) and the PLATO Program Packages of your choice, and you'll be ready to absorb the wisdom of the ages.

The current PLATO software library for the TI includes instruction diskettes in two large groups: Basic Skills and High School Skills. The Basic Skills program packages (each at a suggested retail price of $49.95) are written to instruct students in grades 3-8 in math, reading and grammar. The High School Skills packages (also $49.95 each) cover math, practical reading, writing, science, and social studies. These packages are not just geared to young people from grades 9 to 12 ; they are also designed to help adults who want to study at home or prepare for the General Educational Development (GED) exam.

Although these packages are an educational value in themselves, the Survey Diskettes in three subject areas (math, reading and grammar) that come with the PLATO Interpreter cartridge (also at $49.95) are an even more impressive bargain because they provide parents with a tool for guiding, understanding and even communicating with their children as their learning progresses.

Diagnostic Duo

Most parents want their children to have the best possible grasp of the basic skills as soon as possible. They are, after all, the foundation on which children build all of their future learning. PLATO provides parents with a unique and well-considered double dose of diagnostics to give them all the information they need to place their children

---

*PLATO is a registered trademark of Control Data Corporation.

Learning System

Tools For Student Assessment

By Sharyn Lyon
Technical Editor

in the proper skills subjects and programs. This diagnostic team, which unfortunately doesn't accompany most learning programs, is made up of a Survey Diskette and a Parent Questionnaire. The child works on the computer with one of the Survey Diskettes, taking short tests of 6 to 8 questions. The purpose of these Survey Disks is to familiarize the learner with the computer and to evaluate the student's skill level in order to help him select the appropriate PLATO courseware. The tests on the Survey Disks use multiple choice questions to measure the child's grasp of specific concepts. Each correct answer receives a one- or two-word reward (EXCELLENT!),and each incorrect answer also elicits a short message (THAT'S NOT IT.) from the computer. But although the incorrect answers are identified, the test taker is not given the correct answer. It seems that this is a teachable moment wasted. Graphics are also omitted from these programs. With the exception of the Math Survey Disk for *Basic Number Ideas*, the questions are not enhanced by any graphics for clarification, entertainment, or reward. This omission may make learning and even understanding the question difficult for all except children who can motivate themselves, read and follow directions well, and be encouraged to continue the quiz by a one- or two-word reward for a job well done. Although this Survey Disk program does not instruct the child during the test, each question has a corresponding program on the teaching disk with which the child can learn what he needs to know in order to master the concept.

> **"When a child picks out the subject areas himself and decides to complete the survey test, he is really deciding for himself what he is going to learn and when he will learn it."**

The Survey Disks are used in combination with the Parent Questionnaire because parents and children need to function as a team for optimal learning. While the child works on the Survey Disk, the parents fill out the Parent Questionnaire which asks them what they think the child's capabilities are. The questions are skill-specific, like this one from the Math Parent Questionnaire which doesn't ask just whether the parent thinks the child can "borrow" or "carry" but—

CAN YOUR CHILD FIND THE DIFFERENCE IN THE SENTENCE 72 – 8?

Responding to questions like these gives parents an opportunity to sit back and reflect on what their children really can do. Rarely do parents have a chance to think so specifically about who their children really are and how they, as educational guides, can help their children get where they need to be academically.

Even with a pause to think carefully about responses, the questionnaire can be filled out in a short time since there are only from 2 to 5 questions for each program package. The time spent filling out the questionnaire is well spent because the parent or teacher acquires a maximum amount of usable guidance information about the child with a minimum of effort.

Where Do We Go From Here?

Once the child and parent have completed their respective surveys, they should record scores and answers on the Survey Scores Sheet included with the Parent Questionnaires. This page, which may be duplicated for repeat use or for responses and scores for a different child, provides a place to record parents' answers to the questions in terms of "Yes, No, Don't Know," and the child's score in terms of the number of correct answers on the survey quiz. The page also shows the "suggested" scores for each quiz and provides a column in which to indicate whether or not the child, based on a comparison between his survey score and the suggested score, needs to work on the corresponding program package. In the following example (Figure 1), the parents have recorded their ideas of the child's capabilities, and then compared them with both the child's actual test performance and the score PLATO thinks that the child should attain. The parents have correctly marked that their child does not need to do this *Numbers 0-9 and Numbers 10-1000* package.

The information here is valuable now and will be even more so later on when the child has completed more surveys and teaching disks and may have reached his

Figure 1.

RESPONSE			SURVEY SCORES		PACKAGE NEEDED	
Yes	No	Don't Know	Your Child's Score	Suggested Score	Yes	No
	X					
X			6	6		X

GRAPHICAL ADVENTURES

Complete advantage of TI Extended Basic's **color graphic** and **sprite** capabilities has been taken in the development of four excellent graphical adventures. Maneuver a graphical adventurer around inside a window containing both graphical and word objects. Type **two-word commands** in the form of verb-noun. Exit the window on any side possible and a new window will quickly assemble so the adventurer can continue on his journey. These adventures are extensive and take a long time to complete. Therefore, two of the adventures have a **save-game feature**. All adventures come with instructions and a clue sheet. For 99/4 or 99/4A.

Medieval Graphical Adventure:
Explore a castle, cave, and dragon valley. Meet Merlin and a witch. Gather up to 18 items, such as, sword, rope, key, and herb to help you during your journey. The program understands over two dozen verbs. Save Game Option. Recommended for intermediate or advanced adventurer................**$18.00**

Egyptian Graphical Adventure:
You've been sent back in time to collect Egyptian treasures to save the American government from bankruptcy. Explore a tomb, pyramid and time machine. Meet 3 Egyptian gods. The program understands over twenty verbs. Save Game Option. Recommended for intermediate or advanced adventurer................**$18.00**

Sundial Island I & II:
Shot down over a Japanese-inhabited island in World War II, your mission is to free your co-pilot from enemy captivity by outwitting island natives, Japanese soldiers and other hostile island inhabitants. This extensive adventure had to be made into two parts. Recommended for advanced adventurer **$24.00**

All 3 of the above...........$48

Graphical Adventure:
Collect 6 keys and gold while searching for an exit to a three-level maze complete with robbers, devils, dragons, traps, doors, and much more. No words in this adventure. This adventure is for all levels of adventurers...............**$12.00**

Special Offer

Demonstration Program:
Small parts of three of the graphical adventures have been combined in this program to let you see the quality of these adventures.......**$4.00**

All adventures require
Extended Basic
Cassette Orders Only

Send Check or Money Order to:

Walter J. Dollard
417 Woodland Hills
Pittsburgh, PA 15235

A Complete TI Special Offer
Business Software Package $59
Reg. $159

Save over $100⁰⁰
Written by Pros
Tested by Business
Easy to use

During this special offer, you can purchase a Software package that will cover all the needs of most small businesses for less than the cost of some games.

HOME USE ALSO
- Keep records for a budget
- Record useful tax information
- Keep an inventory and cost of all household items
- Edit all of your typing
- Keep a record of name and addresses of friends and relatives

• Accounting Ledger . . . $39⁹⁵
–Select and name all records
–Up to 100 records for Income and Expenses kept monthly and year-to-date
–Gives subtotal, total and net profits where desired
–Displays to screen or printer up to 6 months and year-to-date

• Inventory Control $39⁹⁵
–Allows you to name your records
–Keeps 6 columns of information for up to 1000 items. The columns are Name, Quantity, Item Cost, Total Cost, Reference Quantity, and Note

• Mail-Out $39⁹⁵
–Keeps a file of 1000 names and addresses (with phone numbers)
–Outputs to a printer for labels to mail out information
–Has file search for names

• Letter Writer $39⁹⁵
–Inputs and Edits to the screen
–Selects a heading, address body, and closing for letters
–Stores and outputs to the printer

DISK DRIVE REQUIRED – Add $2.00 Post.

ALL FOUR FOR $59⁰⁰ (Reg. $159⁰⁰) Special Offer
Mail to: Bizware, Inc. / 5014 Hwy. 29 / Lilburn, GA 30247
Visa ☐ MasterCard ☐ Card #________ Exp. Date ________
Authorized Signature ________
Name ________
Address ________ Phone # ________
City/State/Zip ________
Please send ________ Enclosed $ ________

Bizware, Inc., Atlanta, GA TOLL FREE 1-800-221-7171

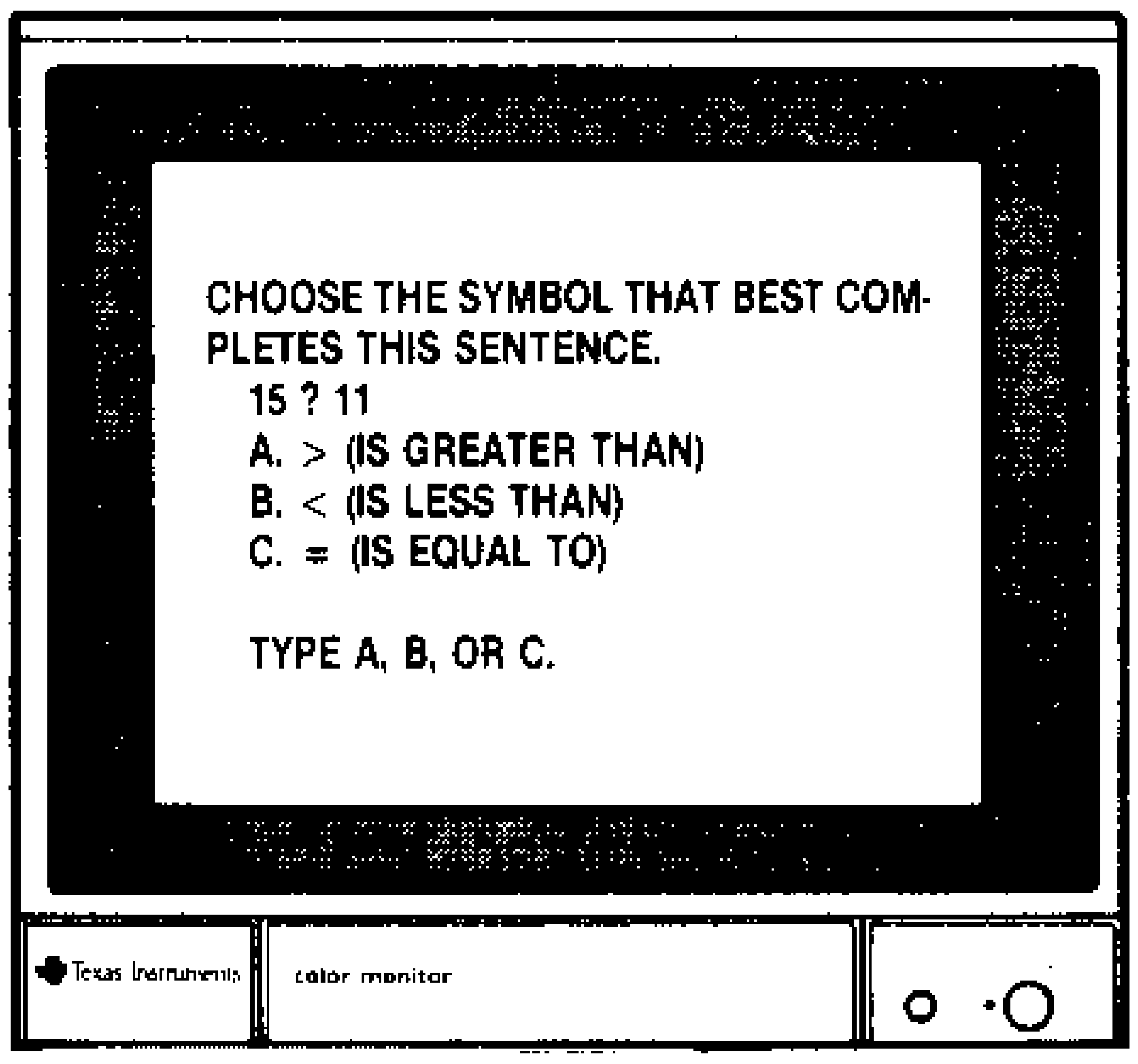
frustration level. At that point it could be helpful to take the child back through one of the programs which made him feel successful. Thumbing through the Survey Scores pages, a parent can quickly and easily pick out likely programs to review in order to replenish confidence and enthusiasm. In this way, the child doesn't lose faith in himself and his abilities.

Everything In Its Place

The Survey Disks and Parent Questionnaires reflect the tremendous amount of thought and research that PLATO's creators and developers have put into their learning program over the past twenty years. The concept presentation is carefully overlapped so that ideas are subtly reviewed throughout the Survey Disks and courseware. The questions build logically upon each other, adding one basic new detail to the concept at a time. The student who follows this progression moves gradually through one thought and on to the next.

The documentation is another strong point of the PLATO system. Everything from powering up your computer and loading the courseware to "Guidelines for Success" is easy to find and clearly presented—complete with diagrams and pictures of selected screens. A dedicated and capable sixth grader could conceivably follow the documentation independently and learn a bit about how the TI system works—while he is learning from the PLATO activities. The on-screen instructions are clear, in a contrasting color block to make sure the user will see, read, and follow them. Following the instructions may not, however, be so easy for young users or any user who is not a very good reader.

Although the Basic Skills program claims to be designed for third through eighth graders, fourth or fifth grade might be a better starting age. The reading proficiency needed to understand how to progress through the program and even how to answer individual questions is beyond what is currently considered third-grade level. The second screen in the *Basic Number Ideas Survey*, for example, looks like this:



```
CHOOSE THE SYMBOL THAT BEST COM-
PLETES THIS SENTENCE.
  15 ? 11
  A. > (IS GREATER THAN)
  B. < (IS LESS THAN)
  C. = (IS EQUAL TO)

  TYPE A, B, OR C.
```

Besides being able to read (sound out) the words, (some of which would be more than a challenge to many third graders), the user must understand the specific meanings intended here for words like "symbol" and "sentence." If the user has not been taught the concept of a number sentence and/or doesn't understand the use of the word symbol, he could very well answer the question incorrectly even if he knows the correct answer. The student could end up being placed in a course that would not challenge him because he didn't know the jargon used in the survey question. Perhaps that question could be modified to read:

CHOOSE THE ANSWER BELOW THAT BEST FITS IN THE BOX.

15 11

The Math Survey Disk from which the example above was taken will assess the student's conceptual levels in nine general areas that appear on the menu: Basic Number Ideas; Addition; Subtraction; Multiplication; Division; Fractions; Decimals; Ratio, Proportion and Percent; and Geometry and Measurement. These nine headings represent over one hundred hours of teaching activities. However, it is inconvenient to go from the middle of a Survey Test in one area back to the Menu. Instead of being able to press [FCTN] [9] to go back to the Menu, you must press [FCTN] [=] and go all the way back to the master title screen. User beware.

The student is placed in a courseware area to work with a program disk when his score is less than the suggested score printed for that test on the Survey Scores Sheet. PLATO wisely leaves the handling of this delicate placement moment up to the parent or teacher. The computer *does*, however, play a part in setting the moment up. As soon as the computer realizes that the student cannot attain the suggested score, it interrupts the survey test with this non-threatening screen:

CAR CARE $12.95

AT LAST useful home software for your home computor. This software set was designed to aid people with their common everyday automobile problems. The package consists of eight program / libraries, on tape, that can be loaded separately on an unexpanded 16K TI99/4A. They include:

1.BRAKES 5.ELECTRICAL
2.COOLING 6.HEATER & A/C
3.ENGINES 7.TRANSMISSION
4.STEERING 8.LEAKS-NOISES

ORDER NOW ! This price is an introductory offer. For your entire set send $12.95 to:

HOMECARE SOFTWARE
P.O. BOX 850
HOPKINS, MINN. 55343

JUST PLAYING GAMES?
You could be designing them with
THE MAXIMUM ASSEMBLER
FOR THE MINI - MEMORY MODULE

Without spending hundreds of dollars for disk and peripherals, you can have this effective tool for creating **LARGE** programs in high-speed assembly language. Requires just the Mini-Memory Module, a cassette recorder, and your TI99/4A console.

THE MAXimum Assembler* outperforms the Line-By-Line Assembler that comes with the MMM.

Compare these features:

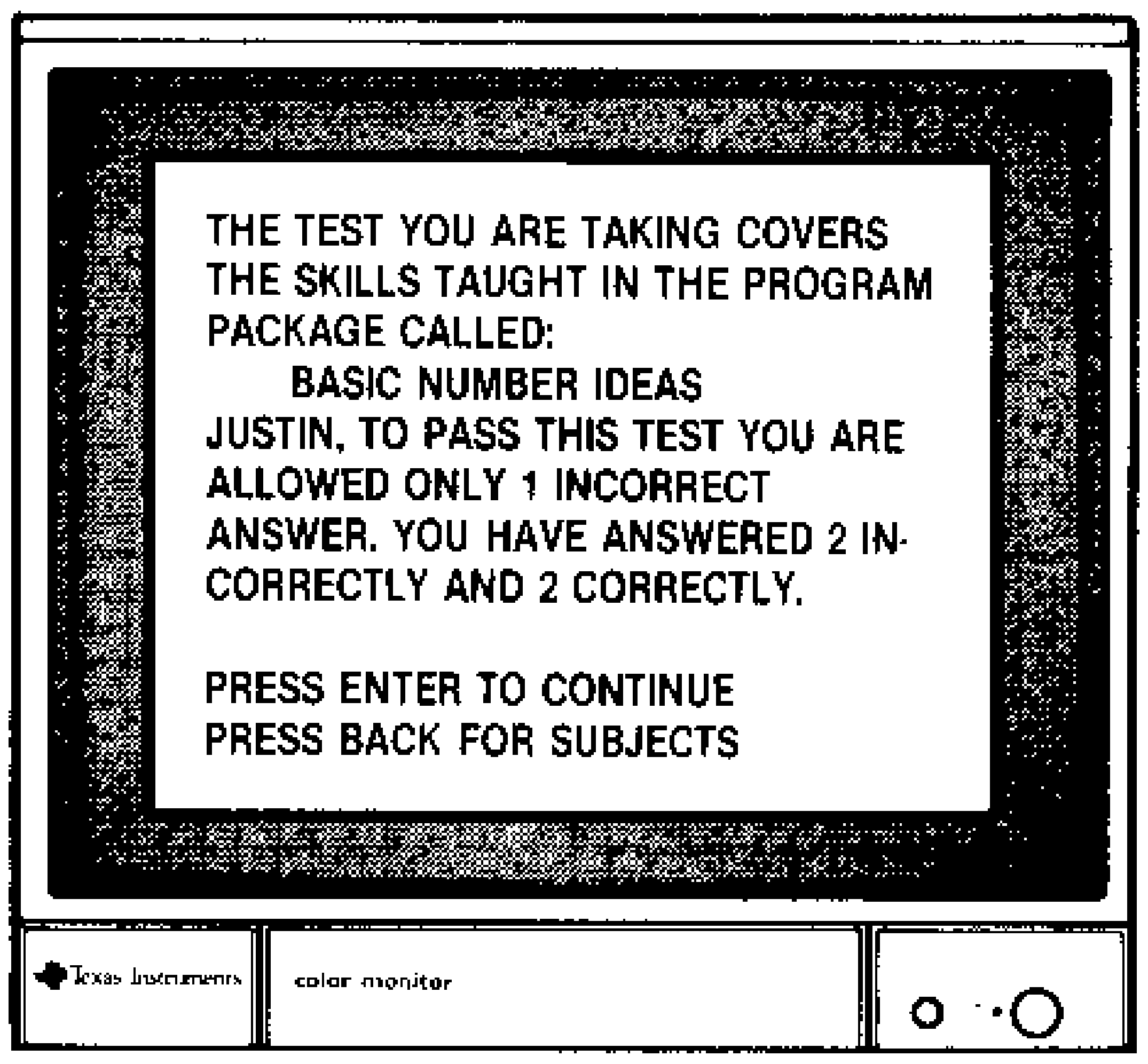
	Line-By-Line	THE MAX
User Program Object Size	760 bytes	3808 bytes
Label Size	1 or 2 chars	1 to 6 chars
Number of Labels	10	100 plus
Saving Source Input	No	Yes
Source Editing	limited	complete
Full Instruction Set	yes	yes
Access to Utilities	by EQU only	Directly by Name

Instruction manual included with cassette

Also available: the **Hex-Calculator** Program
A fast, useful tool for manipulating decimal, octal & hexidecimal numbers. Operations include +, −, x, ÷, and, or, xor, and more.
Requires only the TI-99/4A console.

The Max: $30.00 Hex-Calculator: $15.00
Send check or, for faster service, Money order to:

M. K. ECKHAUS Dept. 883
P.O. Box 1079 — Elgin, Illinois 60120
Inquiry honored only with SASE.
*T.I. Editor/Assembler manual recommended—may be ordered from T.I.


THE TEST YOU ARE TAKING COVERS THE SKILLS TAUGHT IN THE PROGRAM PACKAGE CALLED:
BASIC NUMBER IDEAS
JUSTIN, TO PASS THIS TEST YOU ARE ALLOWED ONLY 1 INCORRECT ANSWER. YOU HAVE ANSWERED 2 INCORRECTLY AND 2 CORRECTLY.

PRESS ENTER TO CONTINUE
PRESS BACK FOR SUBJECTS

If, at this point, the student wants to go on with this test even though he cannot pass it, he may do so by pressing [ENTER]. Another screen will then prompt him to record his score when he finishes this test. If the student wants to escape the embarrassment of a low score, however, he may press [BACK] to go to the Menu and select another subject.

At the time of placement, the parent or teacher may need to explain to the student why he is going to work with a certain PLATO course. Rather than saying that it is because the student got too many answers wrong, the parent might say the same thing in a truer and more positive way. Actually, when a child picks out the subject areas himself and decides to complete the survey test, he is really deciding for himself what he is going to learn and when he will learn it instead of following someone else's curriculum plan. I think Plato would have liked the way the ideal of individualized education is alive and well in the learning system that bears his name.

With the placement phase completed, the student is now ready to explore a specific PLATO course. Next time we visit the Academy we will join a young scholar as he delves into some of the courses in the High School Mathematics series.

Educational Activity Review Criteria

Documentation—rates the printed matter that comes with the activity. It notes whether the instructions are clear, comprehensive and easy to use, and whether the machine configuration requirements are spelled out, and looks for such information as how to load the program, use the keyboard, and restart the activity.

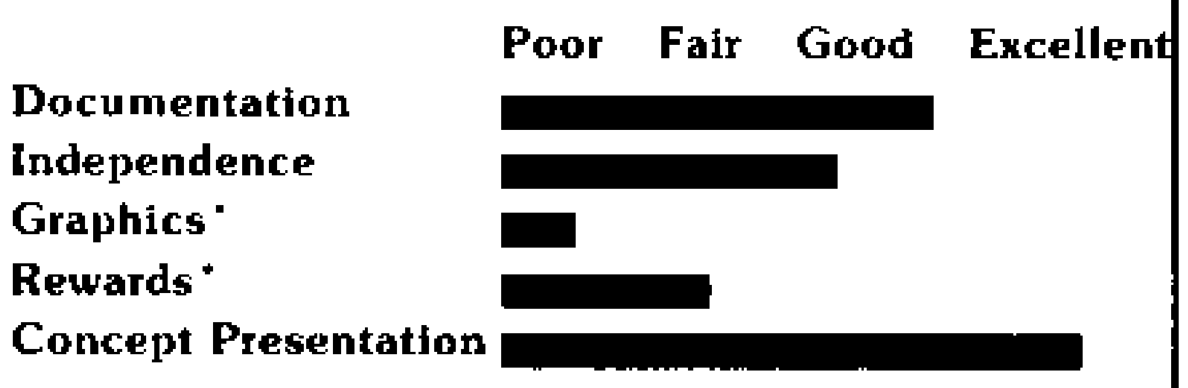
Independence—focuses on how complicated it is for the user to understand the steps needed to progress through the learning activity. It measures to what degree the activity may be done by a user and the computer alone without parent/teacher guidance. Whether the actual reading level of the activity is appropriate for the suggested grade level is another major concern of this rating category.

Rewards—rates the audio-visual rewards as to their motivational effectiveness and appropriateness to the activity.

Graphics—rates the quality of the graphics and whether they enhance or detract from the educational purposes of the activity.

Concept Presentation—focuses on whether the concepts are presented clearly, in logical order and in enough depth for the learner to be able to apply learnings from the activity to other situations.

PLATO Math Survey Diskette
$49.95 suggested retail price



*These categories will be used primarily to evaluate the courseware. Whether or not they should be used to rate the Survey Diskettes is debatable.

System Requirements:
TI-99/4A Home Computer
Disk Memory System
Memory Expansion
PLATO Interpreter Cartridge

Reach for MICRO-ED!

Over 100 Educational Programs for

- Texas Instruments 99/4A

Dealer Inquiries Invited

Send for FREE CATALOG

Please Send me your
FREE CATALOG
For TI

Name

Address

City

State Zip

Micro-Ed, Inc.
P.O. Box 24156
Minneapolis, MN 55424

You can call
us at
1-800-MICROED

SHOPPING
FOR A
PRINTER?
CHECK US OUT

PROWRITER 120CPS

8510(Parallel)	$399.00
8510(Serial)	$569.00

GEMINI 100CPS

10"(Parallel)	$339.00
10"(Serial)	$419.00

SEIKOSHA 50CPS
GX-100P(Parallel) 10"
tractor feed $219.00

CABLES FOR TI
With printer purchase

Parallel	$19.95
Serial	$23.95

MC and VISA add 3%
All prices less shipping

MIDWEST
TECHNICAL
ASSOC, INC
PO BOX 6537
ST LOUIS,MO 63125
314-487-0821

32K Memory Expansion

ICS 1000
32K Memory Expansion Card
For use in the TI Expansion Box.
Price $130.00

ICS 2000
32K Memory Add On
- This model attaches to the right of the console and also allows the use of other peripherals including the peripheral expansion box.

Price $220.00

ICS 2100
RS232/32K Memory Combination
- Includes parallel and serial interface.

Price $280.00

- TI-99/4A compatible
- 6 month warranty
- Master Card / Visa / Prepaid / COD
Utah residents add 5¾% sales tax.
- Shipping Prepaid in U.S.
Allow 2-3 weeks delivery.
- Dealer/Users Group
Inquiries Welcome

Intellitec Computer Systems
2337 Bonanza Court
Riverton, Utah 84065
(801) 254-2333

LEARN TO FLY!

REVIEWED IN JAN. 99'er

The Dow-4 Gazelle is a simulation of a 4-place, single-engine, high performance aircraft, which will provide fun and challenge as you learn to fly. A high quality program written by a professional programmer/analyst who is also an experienced instrument-rated pilot, the Gazelle is a real-time simulation which responds rapidly to the controls (within one second on the average).

On your screen you see the instrument panel, which has 10 dials with moving pointers and 11 indicator lights. The plane is flown with the joystick, while the keyboard is used to control power, flaps, fuel, etc.

The manual contains 30 pages of text, a glossary, and seven full page figures. It introduces you to the art of flying and leads you, a step at a time, from novice to professional. Learn to take-off, land, navigate, fly instrument approaches, and more. If you get into trouble, you can freeze the action in case you need time to assess your situation. Sound effects add to realism.

This program pushes the TI-99/4(A) to its limits. For both 99/4 and 99/4A, Does not require anything other than a joystick and cassette recorder.

Send U.S. $30.00 to:
John T. Dow
6360 Caton
Pittsburgh, PA 15217
First class postage to U.S. & Canada included: Others add U.S. $2.00 for airmail
PA Residents add $1.80 State Sales Tax

Starprobe . . . from p. 36

its way through one of two narrow openings and then through a geometrically regular maze of Xyolian construction. Along the way it will encounter fuel depots and ammo dumps, then in the lowest part of the cave defensive laser installations that must be destroyed before it can reach the bottom.

You have two types of weapons—QuasiThermite bombs and the SuperBeam. The QT bombs are effective against ammo dumps and fuel depots but have no effect on walls or laser machinery. The S Beam is much more powerful, destroying anything in its path, but uses a great deal of precious fuel and ammo—so use it only when absolutely necessary. Hovering and firing the S Beam use up your supplies, but you can replace your limited fuel and ammo by destroying the Xyolian fuel depots and ammo dumps with the QT bomber. The S Beam completely annihilates, so it can't be used to salvage fuel or ammo. A Pause key allows you to freeze play and also monitor your depth, fuel, and ammo.

Starprobe 99 opens impressively with three-dimensional monolithic title letters. Less impressive are the screen instructions which follow and the screen displays of running score and amounts of fuel and ammo left. These purple letters on a black screen are difficult to read at best. Perhaps this is not a problem on the author's color TV, but for use on a TI monitor, a different color combination would have been more appropriate.

This unpromising feature is more than offset, however, by the colorful renderings of cave and maze featured in the game's successively difficult levels of play. The game starts at an encouraging level for beginners, and the varied obstacles in succeeding levels of play prevent the game's becoming tedious.

The game makes excellent use of vertical scrolling to give the illusion of descent. The graphics and colors are eye-catching, although the self-generating maze close to the "bottom" of the Xyolian cave needs to be more sharply defined. The "play again" routine is swift, for almost continuous play.

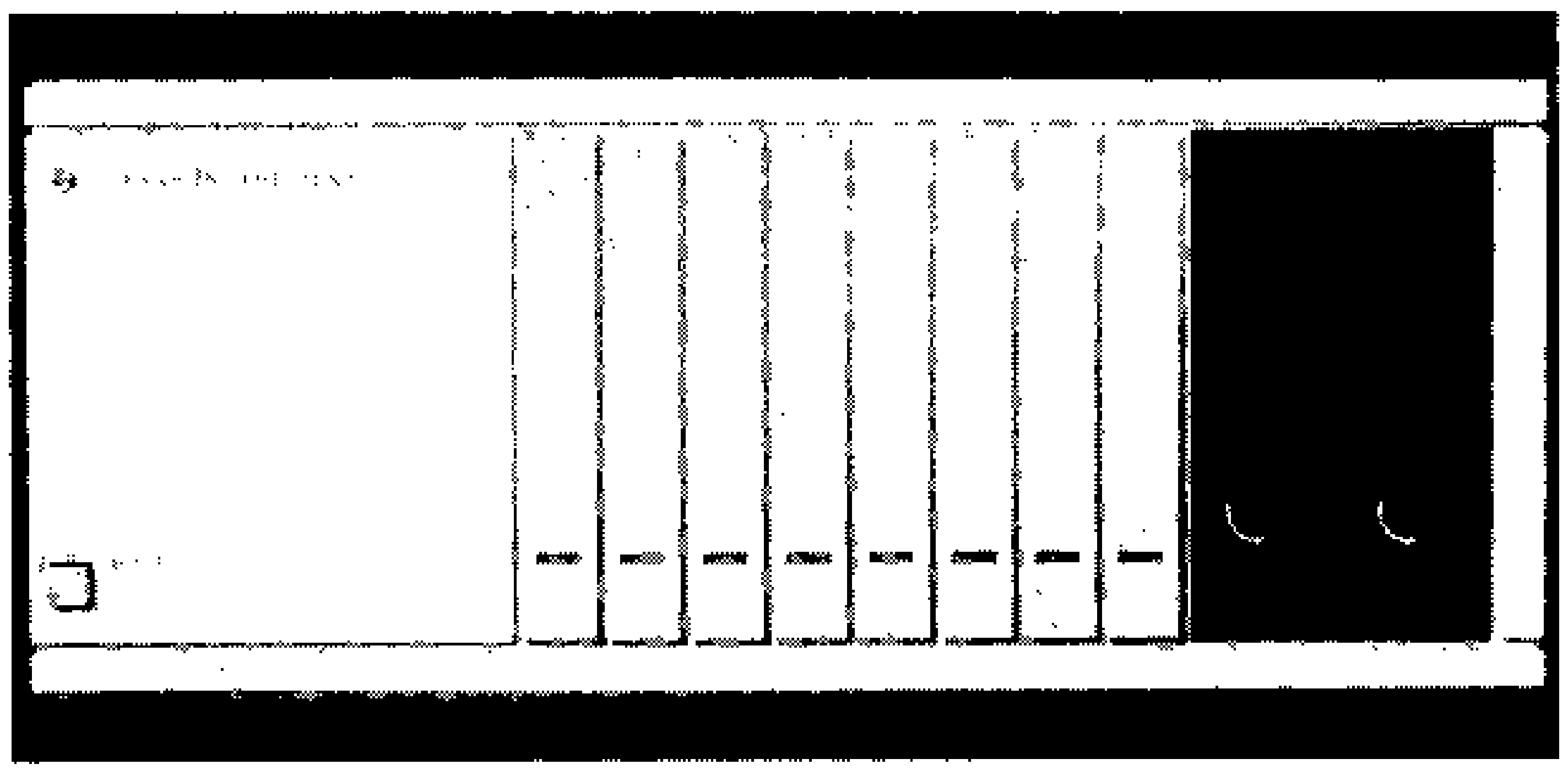
We found though, that the starprobe is sometimes slow to respond to the keys. Although the rate of descent (scrolling) is easily controlled via the hover-thrust key, movements to the left or right can seem rather laborious, and at times the slow response results in what seems like an unfair explosion (you lose!) of your starprobe. This is the most frustrating aspect of the game. You find yourself frantically pushing a key while your oblivious probe continues to drift down to crash against a wall or into the path of a Xyolian laser.

And while we're quibbling, we might mention too that ammo dumps and fuel depots seem indistinguishable from one another. A player can't tell if he's restoring his fire capability or his ability to hover. The documentation is not too helpful on this point. At one point it offers the *caveat*, "Part of the enjoyment in a game of this type comes from the gradual discovery of the 'hidden' rules of the game." This may be true of some aspects of the game, but we would have appreciated documentation that explains how we might detect the difference between fuel depots and ammo dumps and some account of what that attractive, self-generating maze encountered at the nethermost depths of the cave might be. The objective, of course, is to go as deep as possible (5,000 M is a decent score), but the unexplained objects encountered along the way leave players feeling rather mystified, and it all seems rather inconclusive.

Despite the rather sketchy documentation and occasional lapses in performance, *Starprobe 99* is engrossing. The graphics are interesting, and the graduated levels of play keep the player at the keyboard. The game is a good example of the triumph of process over product; that is, players get so absorbed in the various levels of play that they don't really mind having only a vague idea of the scenario and ultimate objective.

MORE SUPER DISK SPECIALS
from WESTERN MICRO SYSTEMS

- New half-height, low-power design allows two-drive mounting as pictured
- Run both single & double density
- Compatible with all TI software & hardware
- Full 120-day warranty



PRICES

Single-sided, 40 track drive	**from $199.00**
Double-sided, 40 track drive	**from $265.00**
Filler plate (for one drive)	$5.00
Installation kit (required for mounting two drives)	$25.00
Star Gemini 10 Printer (with cable)	$359.00
Slimline Drive Power PAK (optional)	$35.00

WMS/2760 S. Havana, Suite S
Aurora, CO 80014
Shipping included for pre-paid
Visa, MC, COD, 4% handling
Order line, 1-800-641-3885
Technical info (303) 337-5909

TI-99/4A * SCHEMATICS * HARDWARE

***** SCHEMATICS *****

Complete up to date, includes pin-out of all ports, memory map, timing & electrical data/diagrams.

1) TI-99/4A	$29.95	ALL 3 SETS (SAVE $11) $45.85
2) Peripheral Expansion Box	$16.95	
3) Speech Synthesis Box	$9.95	

NEW: Schematics set for RS232 Card and 32K Memory Card....$22.95 for both
Complete set of ALL ABOVE SCHEMATICS...............$63.80
Save $16 over seperate prices.

***** HARDWARE *****

RS-232 to BSR X-10 INTERFACE lets your *TI-99/4A control lights, appliances, etc. Works with BSR X-10, Radio Shack Plug-N-Power, Sears Home Control System and Leviton controllers. Easy to install INSIDE YOUR CONTROLLER. RS-232 port required. Instructions have sample BASIC program listing included. NO machine code necessary. Kit includes interface module with cable, RS-232 connector, mounting hardware, and instructions for installation and operation.

Interface Kit.......................................$39.95 OR

BSR X-10 Controller with module installed and fully tested ..$99.95

***Also works with other computers. Call for details.**

EXPERIMENTER CHASSIS. Bolt the guts of your TI-99/4A onto this open chassis and get access to signal lines during normal operation. Holds everything safe and secure for hardware experiments. Computer will run cooler for longer life. Includes mounting hardware.

EXPERIMENTER CHASSIS........................$44.95

FORMORALL Applied Electronics Inc.
800 S.W. Liberty Bell Dr., Beaverton, Ore. 97006
1-503-645-0485 *Please allow 4-8 Wks*

30 DAYS
MONEY BACK
1 yr SERVICE

NOW THAT WE HAVE YOUR ATTENTION...

MEAN STREETS

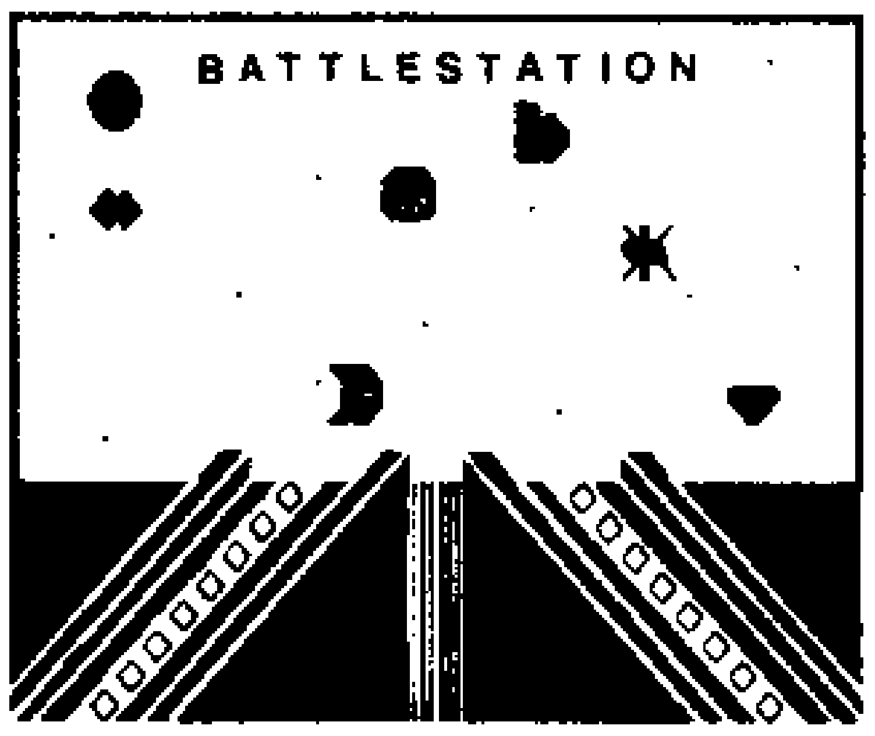
COPS-
ROBBERS-
AMBULANCES-
TANKS-
HI-RES 3-D GRAPHICS
FAST ACTION-
EXT. BASIC-

$17.95 PPD
CASS/DISC

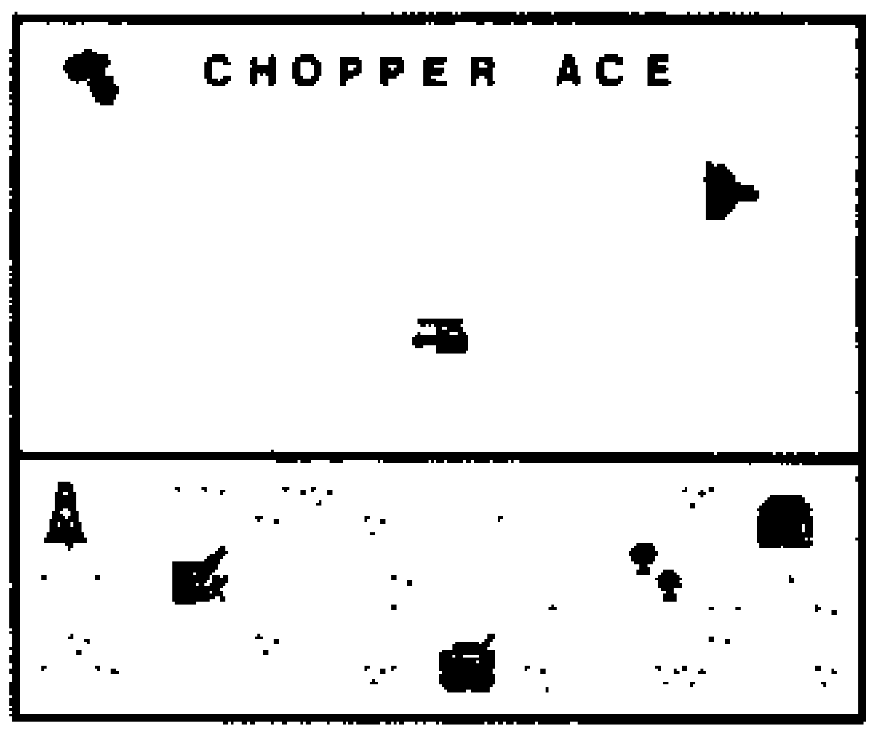
"ALPHA" SOFTWARE

BOX 463
WEST SENECA, NY 14224

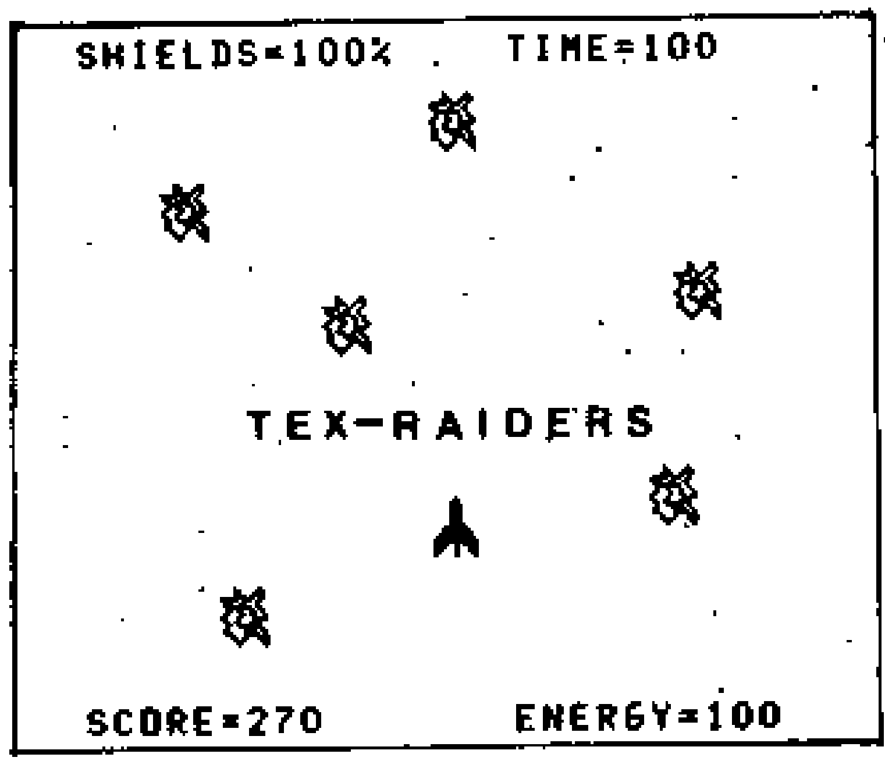
MIRAGE



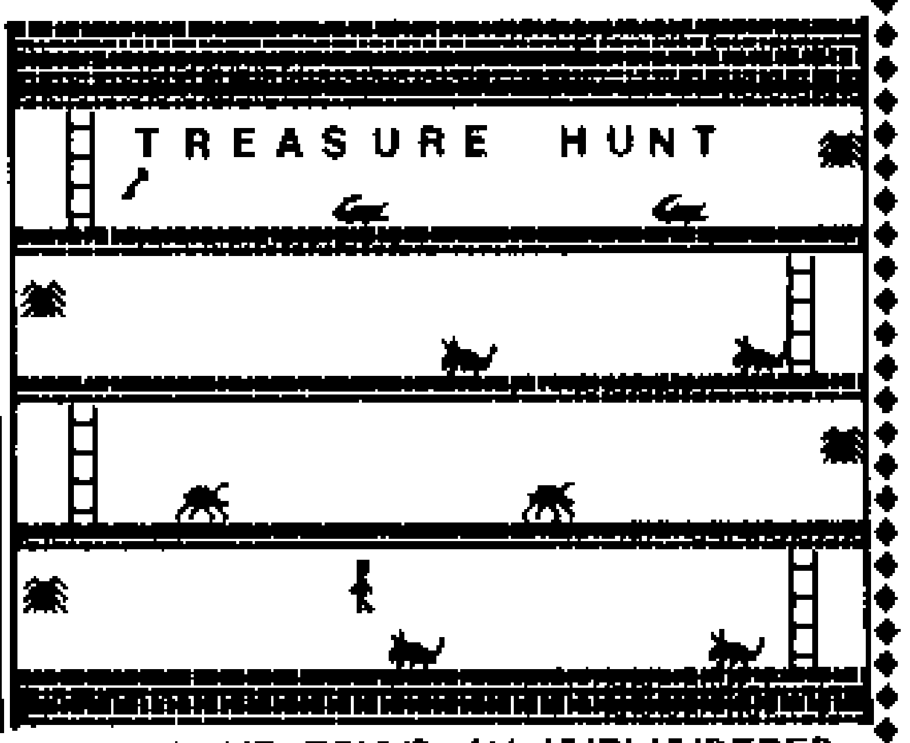
1 OR 2 PLAYER GAME, FLY THROUGH THE ASTEROIDS, DEFEND YOUR BATTLESTATION.



SAVE YOUR DRILLING CREW FROM THE REVOLUTIONARYS, A FAST ACTION CHOPPER RESCUE GAME.



SAVE THE EARTH FROM INVADING ALIENS, BLAST THROUGH ASTEROIDS GOTO HYPERSPACE, CHECK THE ENEMY POSITION WITH YOUR MAP. A FAST ACTION 2 SCREEN GAME.



YOU HAVE FOUND AN UNPLUNDERED TOMB. THERE IS TREASURE EVERY WHERE, BUT WATCH OUT FOR THE CREATURES THAT PROTECT IT. A 4 SCREEN GRAPHIC ADVENTURE.

SEND $17.95 EACH FOR EX. BASIC CASSETTE OR DISK TO:

MIRAGE SOFTWARE
P.O. BOX 613
WEST SENECA, NY 14224

NY RESIDENTS ADD 7% SALES TAX
AREA CODE (716) 674-5511

SEND SELF ADDRESSED STAMPED ENVELOPE FOR SOFTWARE CATALOG

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at **$199.95 complete!!**
with Power Supply and Case.

Tandon — Siemens — Remex — MPI — Teac — Shugart

single sided 40 track — dual sided 40 track
single sided 80 track — dual sided 80 track
for

RADIO SHACK[1]— HEATH/ZENITH[2]— APPLE[3]/FRANKLIN[4]
IBM/PC-TEXAS INSTRUMENTS[6]& MOST OTHER COMPUTERS

Drive a Hard Bargain!!™

8 M.B. - 12M.B. with Power Supply Case, Cables & Software
Complete Systems . . . . from $1,295.00

Amazing Special!-dual sided 40TK or 80TK drive with Power Supply and Case
and Our Special Warranty - Starting at $Call

TOLL FREE ORDERING	**GENERAL AND TECHNICAL**
1-800-343-8841	**1-617-872-9090**

Model I/III/IV **Drives** (0 1 2 3)	*starting at* ***$175.00***
Color Computer Drives (0 1 2 3)	*starting at* ***$Call***
Apple/Franklin Compatible Add-On Drives	$229.95
Apple/Franklin Compatible Drives with Controller	***$299.95***
Model I/III/IV Memory Upgrade	*starting at $Call*
Printers — Daisywheel/Dot Matrix	$Call
Diskettes	**Quantity** Priced from $17.00
Cases and Power Supplies — (Single-Dual-**1/2 Height**)	starting at $49.95
Printer **Buffers** 8K to 512K	starting at $143.95
Percom Double Density Controller (Model I)	$Call
Holmes Model I/III Speed-up Mod-VID/80	*starting at* $90.00
Gold Fingered **Edge Card Extenders**	*starting at* $13.00
Cables — Printer/Disk Drive	*starting at* $25.00
DOSPLUS	***$Special prices***
Repair Services Now Offered for Disk Drives— *Fast Turn-a-Round*	$Call

One Year Warranty Available on all Drives!

SOFTWARE SUPPORT, INC.

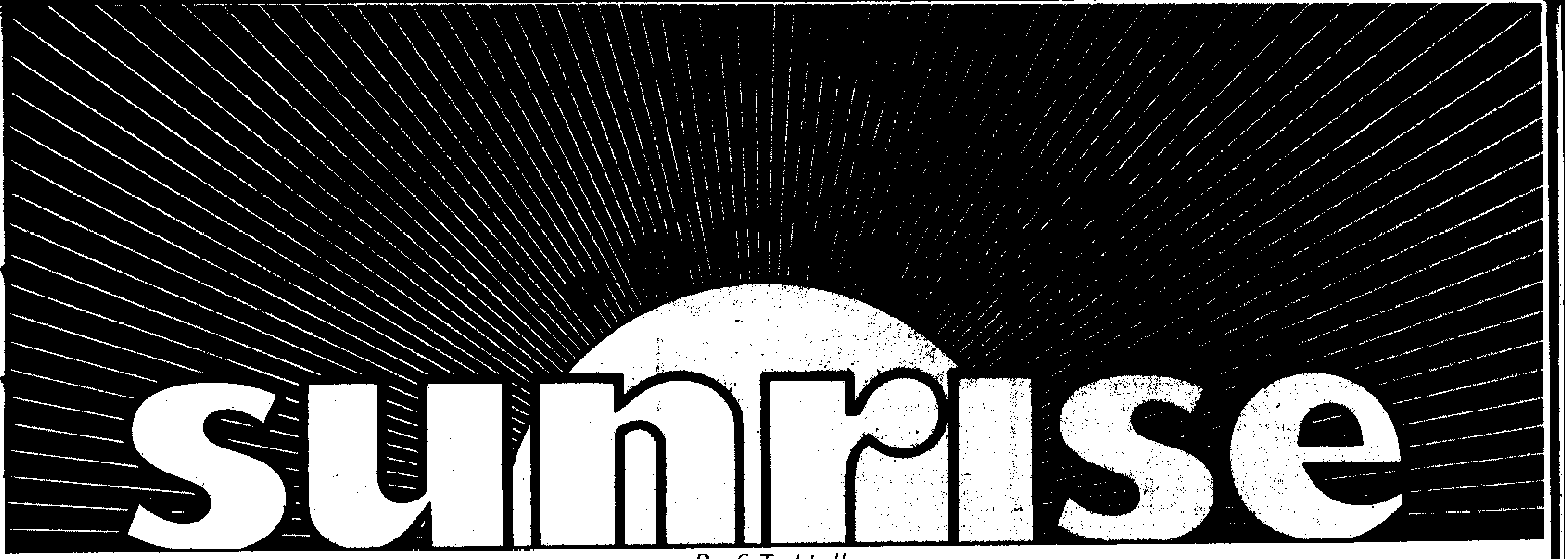
One Edgell Road, Framingham, MA 01701 (617) 872-9090
Hours: Mon. thru Fri 10 am to 6 pm (E.S.T.) Sat. 10 am to 5 pm

Dealer inquiries invited.

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.

Canada
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 405
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 845-1534**
Canadian Toll Free 800-361-5155

1 ™TANDY CORPORATION
2 ™ZENITH DATA SYSTEMS
3 ™APPLE COMPUTER CORP.
4 ™FRANKLIN COMPUTER, INC.
5 ™IBM CORPORATION
6 ™TEXAS INSTRUMENTS
© Copyright 1983



sunrise

By S.T. Holl
8215 Clifton Farm Ct., Alexandria, VA 22306

Good day to all of you artists, latent and otherwise! Welcome to the dynascape studio.

A dynascape, as I am sure you are all aware, is a landscape or seascape or cityscape which grows or changes or contains some sort of movement. This month I am pleased to be able to present a short 50-statement dynakit by a renowned dynascape painter, Trompe l'Oeil, along with an explanation. All you will need to complete this kit is your TI-99/4A computer and a color TV or monitor.

Today we are going to create a sunrise, complete with morning twilight and the rising sun. I will present a series of TI BASIC program lines which you can enter as you read along. The sunrise develops a bit at a time, and we will be able to see some of the mechanisms at work after just a few lines. The places where you can run the program and check your progress are marked RUN following the program lines. I will explain the underlying gears and cogs as they are installed; if clockwork interests you, then follow along. Of course, you might enjoy customizing the kit as you go, but if you are simply interested in the panorama, then type in the lines as they appear.

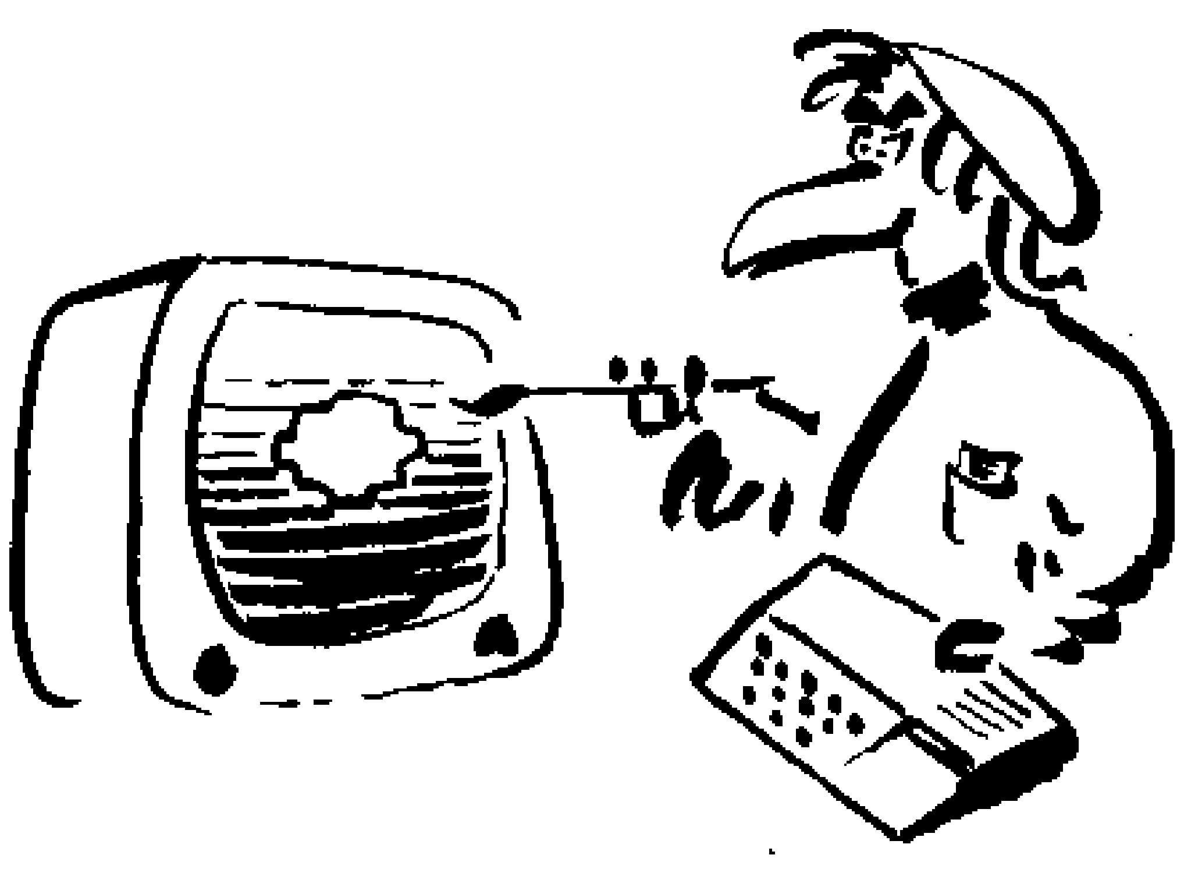
Starlight, Star Bright

We shall begin with the darkness before the dawn. Turn the computer on, select TI BASIC or Extended BASIC if you have that, and enter these lines:

```
150 DATA 32,42
160 READ SKY, STAR
170 CALL CLEAR
180 CALL SCREEN(2)
190 CALL COLOR(1,2,2)
200 CALL COLOR(2,16,2)
250 CALL HCHAR(23,1,SKY,32)
260 CALL HCHAR(23,RND*30+1,
    STAR,1)
270 PRINT :
290 GO TO 250
RUN
```

There you have the starry night scrolling up the screen. Not bad for a mere ten lines, is it? While the stars are rolling past, let us reflect a bit on what we have done and how we are going to proceed.

The dynascape painter's palette is his assignment of foreground and background colors to the 16 character sets; a CALL COLOR statement is the equivalent of squeezing a dab of paint from the tube. The brushstroke styles are the ASCII characters plus the characters reconfigured with the CALL CHAR command. Painting a brushstroke on the screen is done with CALL HCHAR and CALL VCHAR statements.



In the program segment we now have running, we have established color set 1 as all black (statement 190) and set 2 as white on black (statement 200). Lines 150 and 160 give the variable SKY a value in set 2. Conveniently, the * character, number 42, is in set 2. Line 250 paints a streak of black across the bottom of the screen and line 260 puts a star some random place in it. Line 270 scrolls the screen upward. By the bye: We will make lines 150 and 160 do quite a bit of additional work for us before we are through, so if you haven't mastered the EDIT mode for changing statements instead of having to retype them completely, then perhaps this is the time to read over that part of your BASIC manual.

Stop the program now with the CLEAR command [FCTN] [4]. To get the program to move on to the next stage after a modicum of night sky, convert that endless loop into a FOR loop with these statements:

```
240 FOR DARK=1 TO 50
290 NEXT DARK
```

The old line 290 disappears automatically when the new one is entered, and of course you can enter new lines in any order and the computer will ensure that they are placed in numerical order.

Calling All Colors

We would like the black sky to gradually fade to grey—color 15. We'll start with modifications of 150 and 160 and then add a few more lines:

```
150 DATA 32,42,2,3
160 READ SKY,STAR,FGC,CHSET
300 BGC=FGC
310 DATA 15
320 READ FGC
350 CHSET=CHSET+1
380 CALL COLOR(CHSET,FGC,BGC)
```

Line 380 actually adds the dab of color to the palette; in it, FGC and BGC are foreground and background color variables, and CHSET is the character set. We have added initial values of FGC and CHSET to the initial DATA and READ statements, and then we have arranged for the current foreground color to be transferred to the background (line 300) and for a new foreground color to be read (lines 310 and 320). Line 350 bumps the character set number up to the next one.

Now to plan our brushstrokes. We will strive for an Art Deco effect by introducing our next color as a series of horizontal lines across the bottom of the screen, each broader than the last. There are 64 dots, or 'pixels,' in each character the TI-99/4A displays. These picture elements are arranged in eight rows, and the pixels in a given character can be set to show either the foreground or background color by using the CALL CHAR routine. The details are in your language reference manual, but for the moment you only need to know that CALL CHAR(SKY,"00000000 00000000") specifies a solid square of background color and CALL CHAR(SKY, "FFFFFFFFFFFFFFFF") specifies a square of the foreground color. By mixing the F's and 0's we can mix the two. We will mix them two symbols at a time, since two of them correspond to one row of pixels. Here is the code:

TITAN SOFTWARE
PRESENTS

GOPHER

Can you help the Gopher move through the ever changing maze; racking up as many points as possible as you do. A superior fast action game for 1 or 2 players that fully utilizes the speed and graphics of TI's extended basic. Joysticks optional (but recommended).

✱SPECIAL INTRODUCTORY OFFER✱
✱ Beat our high score in Gopher and win another game from our catalogue **FREE** (Photo of screen as proof) ✱

✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱

You can also test your skills with the following:

VIDE-O-THELLO: The classic game of strategy derived from the ancient game of GO. For 1 or 2 players with 'Help' mode and many skill levels and options. (xbasic).

BRAINTWISTERS I: A 3 pack of games to test your powers of logic to the fullest, magic square (xbasic only), switchboard & decoder (basic or xbasic).

BRAINTWISTERS II: 2 more games to drive you crazy; Solitaire and Echo (basic or xbasic).

AND OTHERS: Write for a free brochure.

All games are available on cassette for the 4A and cost $15.95 each ($19.95 Canadian; Ont. residents add 7% sales tax). Add $1.50 per order P & P. Money order, certified cheques, Visa or Mastercard (give card # exp. date). Personal cheques add 4-6 weeks. No C.O.D.'s.

TITAN SOFTWARE
1382 FORDON AVE.,
PICKERING, ONT
CANADA L1W 1J9

SOFTWARE FOR EARLY LEARNING

THinc

THinc Names for 3-6 year olds

- Young children can create their own graphic scenes
- And learn to use the keyboard letters to spell common household words.
- Menu allows parents to personalize program with names from child's own environment.

THinc Graphics for 3-96 year olds

- A screen color drawing program that three year olds can use.
- Plus, a sophisticated graphic character generator that automatically creates hex codes for re-use in other programs.

Send $14.95 for either console basic cassette and catalog of other educational programs:

THinc
P.O. Box 6129
Ft. Wayne, IN 46806

```
220 FG$="FFFFFFFFFFFFFFFF"
230 BG$="0000000000000000"
410 FOR EIGHTH=1 TO 8
420 PATTERN$=SEG$(FG$,1,2*
    EIGHTH)&SEG$(BG$,1,2*(8-
    EIGHTH))
430 SKY=(CHSET+3)*8+EIGHTH-1
440 CALL CHAR(SKY,PATTERN$)
450 CALL HCHAR(23,1,SKY,32)
540 PRINT :
560 NEXT EIGHTH
RUN
```

That's the ticket, except that the dawn comes more slowly in my neighborhood. We'll fix that later on.

What colors come after grey? I think pink on grey gives a marvelous effect—then deep yellow perhaps, a delicate touch of green, and then the blues. Here are the corresponding color codes, followed by a zero, in our color data line:

```
310 DATA 15,9,11,4,5,6,6,6,6,0
```

The zero signals the end of the string of color codes provided. The following code will take advantage of that signal to become an endless loop on the last color:

```
330 IF FGC<>0 THEN 350
340 GO TO 340
```

Somewhere Over the Rainbow

We would like to be able to put an arbitrary number of colors in data line 310, so let's add a flourish which will enable us to reuse character sets:

```
360 IF CHSET<7 THEN 380
370 CHSET=2
```

And we will need this to complete the loop:

```
570 GO TO 300
RUN
```

You will, I am sure, want to run this several times, adjusting the colors in the data line until the sequence suits you.

Now, how about the sun? We will generate a yellow character set for that, using this dab of paint:

```
210 CALL COLOR(8,11,11)
```

We will also add a bit more to lines 150 and 160 to define the variable SUN as well as several more variables. We will need:

```
150 DATA 32,42,2,3,88,6,0,0,0
160 READ SKY,STAR,FGC,CHSET,
    SUN,SUNRISE,SUNHI,ONN,OFF
```

When the color of the sky first matches the color code in SUNRISE, the sun will begin to rise. Line 390 will make this check; if there is a match, the program sets ONN to 1 in line 400. The clockwork will operate until a sun of size SUNHI appears, and then the value of OFF will be changed from 0 to 1 also, providing the signal for the sunrise mechanism to be ignored thereafter. I have set the SUNRISE signal to be dark blue (6).

```
390 FGC<>SUNRISE THEN 410
400 ONN=1
460 IF OFF+(1-ONN) THEN 540
470 SUNHI=SUNHI+1
480 SWIDE=SUNHI
490 IF SWIDE<5 THEN 510
500 SWIDE=9-SWIDE
510 CALL HCHAR(23,17-SWIDE,
    SUN,2*SWIDE)
520 IF SUNHI<8 THEN 540
530 OFF=1
RUN
```

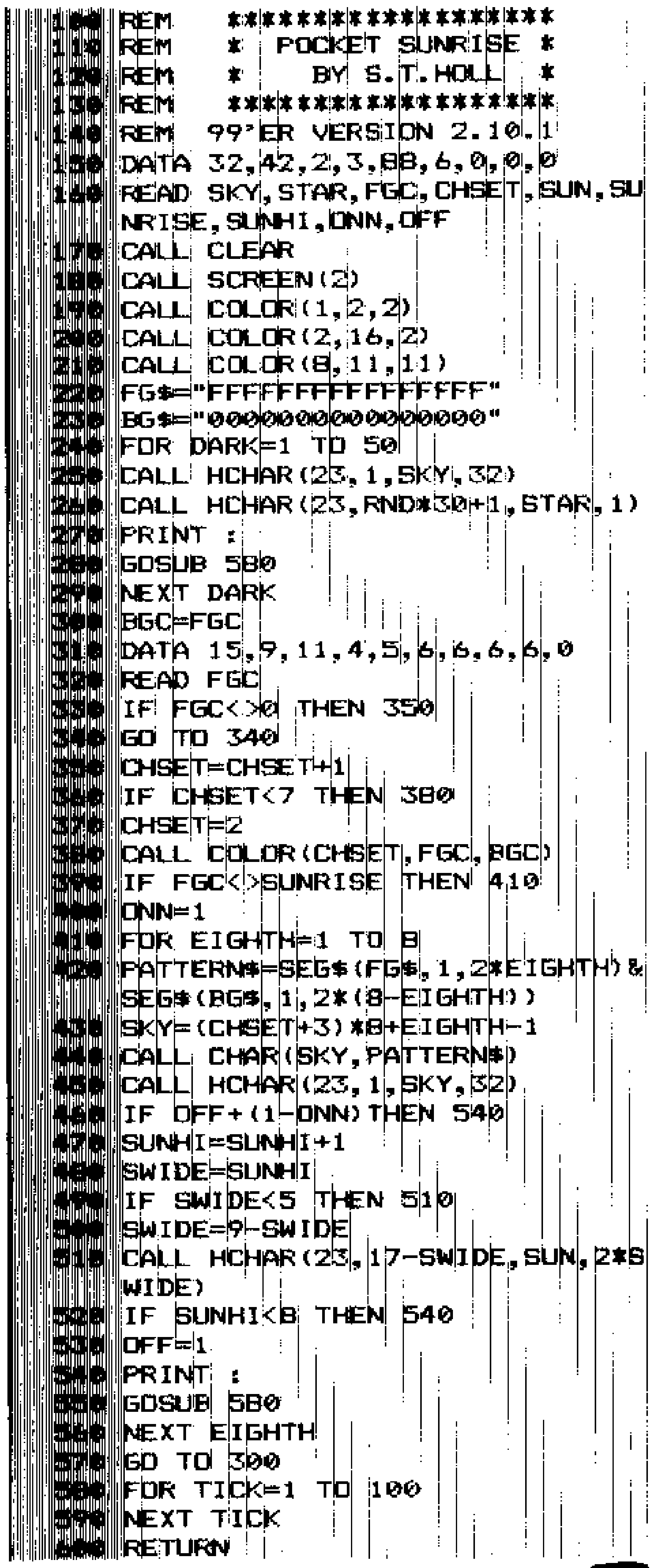
Here Comes the Sun

There we are—a bit more cubist that I ordinarily prefer, but it'll do.

Now I promised we would adjust the speed a bit. Here is what we will use:

```
280 GOSUB 580
550 GOSUB 580
580 FOR TICK=1 TO 100
590 NEXT TICK
600 RETURN
RUN
```

Adjust the value of the upper limit to line 580 to vary the quickness of the day. Voila! The dynascape kit is complete. There is an entire listing following this article. Next time you visit the studio we'll see what dramatic additions we can make when we write this in Extended BASIC. Of course, no masterpiece (or program) is ever complete while the artist is still alive; you can continue to touch this up when the fancy strikes for as long as you live . . . So key in, and rise and shine. It's a good day for programming!



```
100 REM   ********************
110 REM   *  POCKET SUNRISE *
120 REM   *     BY S.T.HOLL  *
130 REM   ********************
140 REM  99'ER VERSION 2.10.1
150 DATA 32,42,2,3,88,6,0,0,0
160 READ SKY,STAR,FGC,CHSET,SUN,SU
NRISE,SUNHI,ONN,OFF
170 CALL CLEAR
180 CALL SCREEN(2)
190 CALL COLOR(1,2,2)
200 CALL COLOR(2,16,2)
210 CALL COLOR(8,11,11)
220 FG$="FFFFFFFFFFFFFFFF"
230 BG$="0000000000000000"
240 FOR DARK=1 TO 50
250 CALL HCHAR(23,1,SKY,32)
260 CALL HCHAR(23,RND*30+1,STAR,1)
270 PRINT :
280 GOSUB 580
290 NEXT DARK
300 BGC=FGC
310 DATA 15,9,11,4,5,6,6,6,6,0
320 READ FGC
330 IF FGC<>0 THEN 350
340 GO TO 340
350 CHSET=CHSET+1
360 IF CHSET<7 THEN 380
370 CHSET=2
380 CALL COLOR(CHSET,FGC,BGC)
390 IF FGC<>SUNRISE THEN 410
400 ONN=1
410 FOR EIGHTH=1 TO 8
420 PATTERN$=SEG$(FG$,1,2*EIGHTH)&
SEG$(BG$,1,2*(8-EIGHTH))
430 SKY=(CHSET+3)*8+EIGHTH-1
440 CALL CHAR(SKY,PATTERN$)
450 CALL HCHAR(23,1,SKY,32)
460 IF OFF+(1-ONN)THEN 540
470 SUNHI=SUNHI+1
480 SWIDE=SUNHI
490 IF SWIDE<5 THEN 510
500 SWIDE=9-SWIDE
510 CALL HCHAR(23,17-SWIDE,SUN,2*S
WIDE)
520 IF SUNHI<8 THEN 540
530 OFF=1
540 PRINT :
550 GOSUB 580
560 NEXT EIGHTH
570 GO TO 300
580 FOR TICK=1 TO 100
590 NEXT TICK
600 RETURN
```

AUTHORIZED DEALER

TEX-COMP™

TI USERS SUPPLY COMPANY
"YOUR LUBBOCK CONNECTION™"

NEW PRODUCT
IMMEDIATE DELIVERY

Proudly Introduces

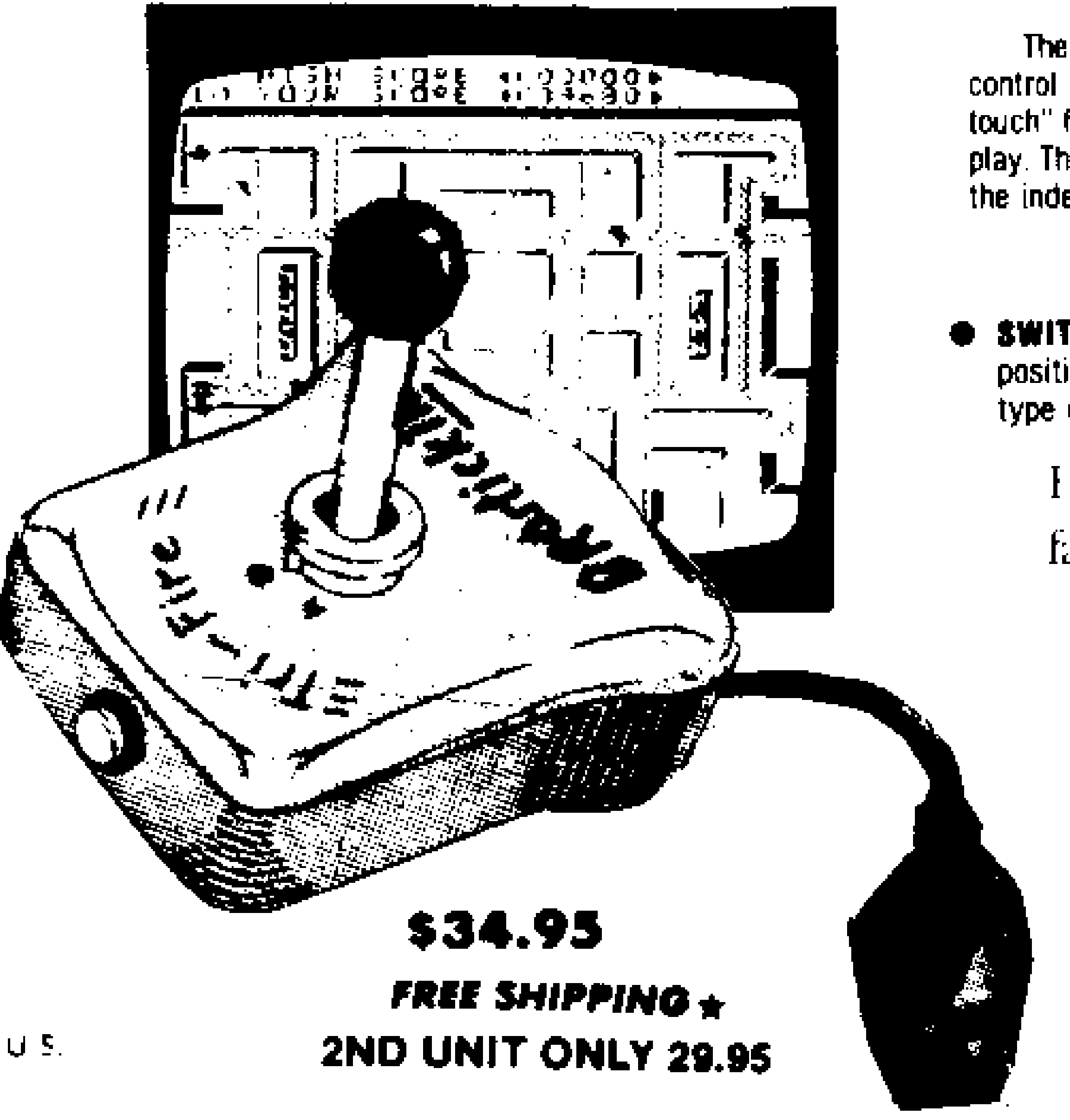
SUPER JOY STICK II

THE ONLY JOYSTICK THAT CAN CONTROL

THE MUNCH MAN !

RATED #1
August 1982 © Creative Computing

new
Available exclusively from TEX-COMP



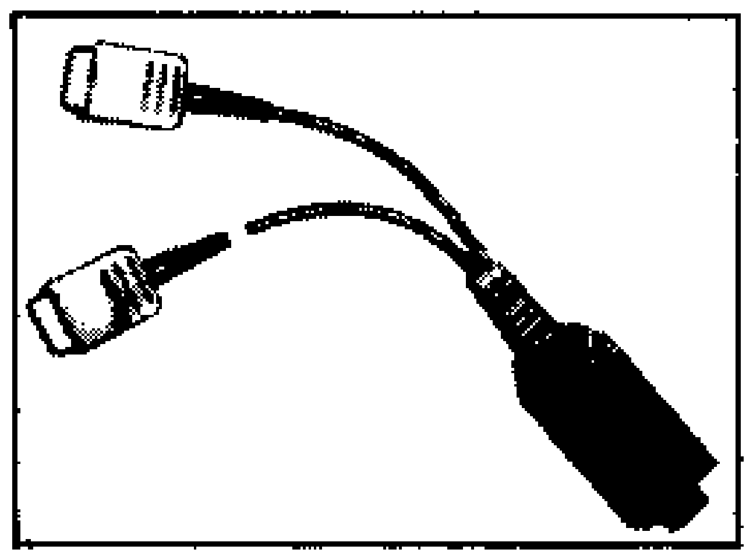
Improved version

The case has been redesigned for easy hand-held operation. The solid steel, short-throw control shaft with an arcade-style ball on the top offers precise, 8-position action. The "soft-touch" fire button is located at the top end of the molded base allowing either right or left-hand play. This improved fire button location is designed to take advantage of the greater dexterity of the index finger resulting in quicker response time and less fatigue during extended play.

SAME ACTION AS THE REAL ARCADE GAMES

- **SWITCHABLE GATE-PLATE™**: Setting the switchable gate-plate indicator to the 4-way position allows only horizontal or vertical motion dramatically improving response for maze-type games

Helps you make higher levels of Munchman ... if you're fast enough.



WITH FREE
Port Expander

$34.95
FREE SHIPPING★
2ND UNIT ONLY 29.95

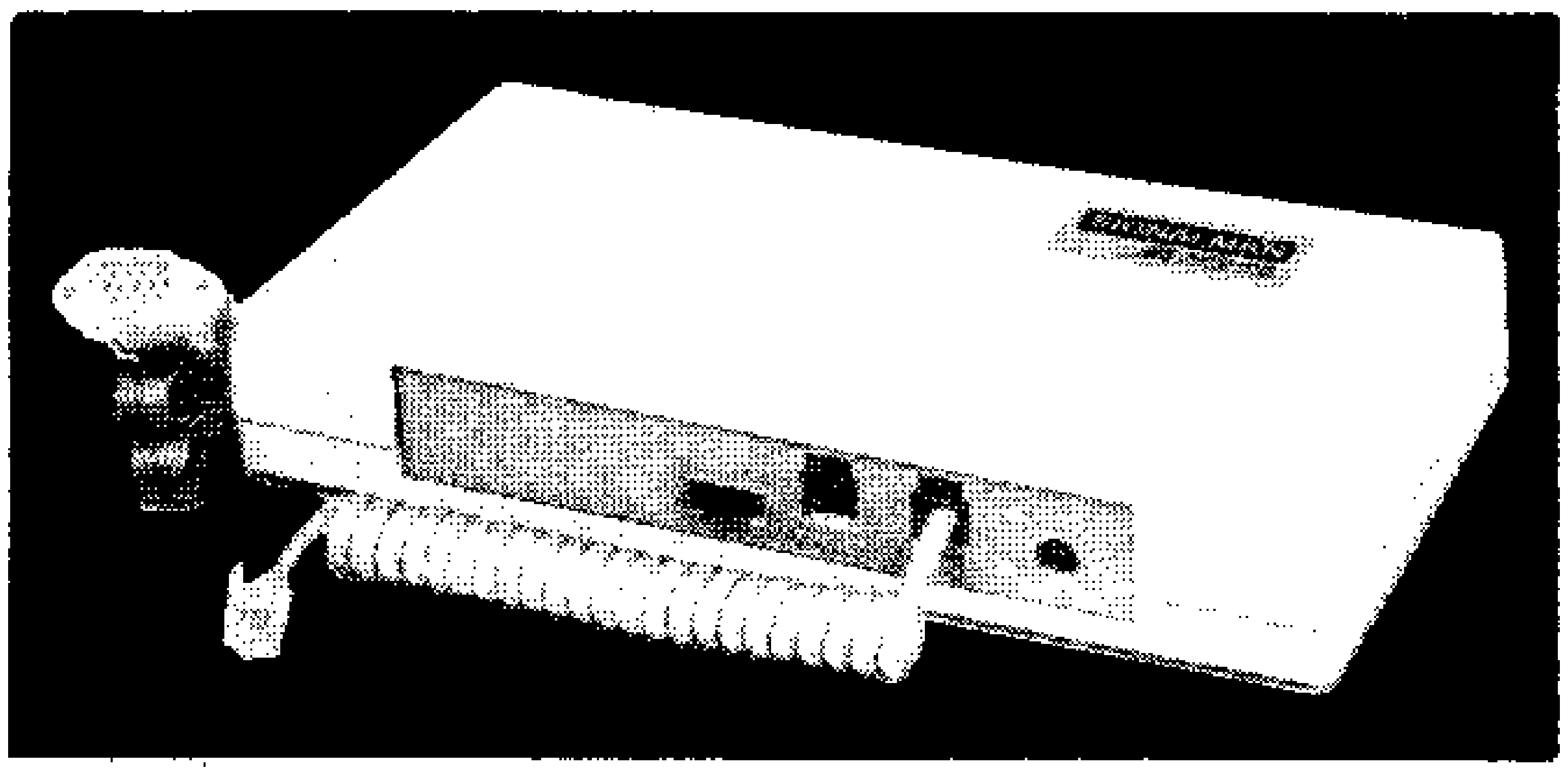
★CONTINENTAL U.S.

Add 3% for Visa or MC

Send Check or Money Order to: **TEX-COMP ● P.O.BOX 33084 ● GRANADA HILLS, CA. 91344 ● (213) 366-6631**
SEND FOR FREE ORDER KIT AND COMPLETE PRICE LIST
CONTAINS MONEY SAVING SPECIAL OFFERS AND NEW PRODUCT INFORMATION

TEX-COMP™

USERS SUPPLY DIVISION



Proudly Introduces
The SIGNALMAN™ MARK III
TI 99/4A COMPATIBLE

MODEM

Finally, a low cost, direct connect, high quality and super reliable TI-99/4 and 99/4A compatable modem that comes complete and ready to use — just plug it into a TI RS/232 interface or expansion card.

SPECIFICATIONS

Data Format	Serial, binary, asynchronous		
Operate Mode	Manual dial, Automatic ANSW/ORIG selection		
Data Rate	0 to 300 bps, full duplex		
Modulation	Frequency shift-keyed (FSK)		
Line Interface	Direct-connect		
Data Interface	TI RS-232C compatible, built-in cable to computer		
Transmit Frequency		ORIG	ANSW
	MARK	1270 Hz	2225 Hz
	SPACE	1070 Hz	2025 Hz
Transmit Frequency Accuracy	± 0.01%		

Transmit Level	−12 dBm typical		
Receive Frequency		ORIG	ANSW
	MARK	2225 Hz	1270 Hz
	SPACE	2025 Hz	1070 Hz
Receive Frequency Tolerance	± 0.5%		
Carrier Detect Threshold	−44 dBm typical		
Carrier Detect Indicator	Audible tone		
Power Requirement	Internal 9V transistor battery* or 110 VAC through adapter*		
Size	8⅞" x 4¾" x 1¾"		

*Not included

Meet the direct-connect SIGNALMAN MARK III designed for use with your TI-99/4A Accessories Interface the smallest, lightest, most compact modem available today. Its long life 9-volt internal battery and exclusive audible Carrier Detect Signal allow you to install the SIGNALMAN anywhere . . . out of the way, and out of sight. Now, there's no need for messy cables, and no need to look at a LED to verify carrier.

Your SIGNALMAN transmits both voice and data over all common telephone lines, and is fully compatible with Bell 103 modems — putting your computer in instant communications with thousands of other computers. And when you're in the data position, your SIGNALMAN automatically changes from ORIGINATE to ANSWER and back again as the need arises — ending all that confusion.

Anchor Automation has taken the fuss out of communications.
For business or fun, SIGNALMAN is the ideal modem.

NEW FEATURE – WORKS WITH ANY PHONE

Comes complete with cable and cord. This is a unit specially designed for the TI-99/4A and should not be confused with other Anchor/Signalman models that sell for less and/or are not compatible with the TI-99/4A.

Send for our free Order Kit — discounts on entire product line

©1982 CALVERT ENGR. INC.

Mfg.
Suggested
List Price
$139.00

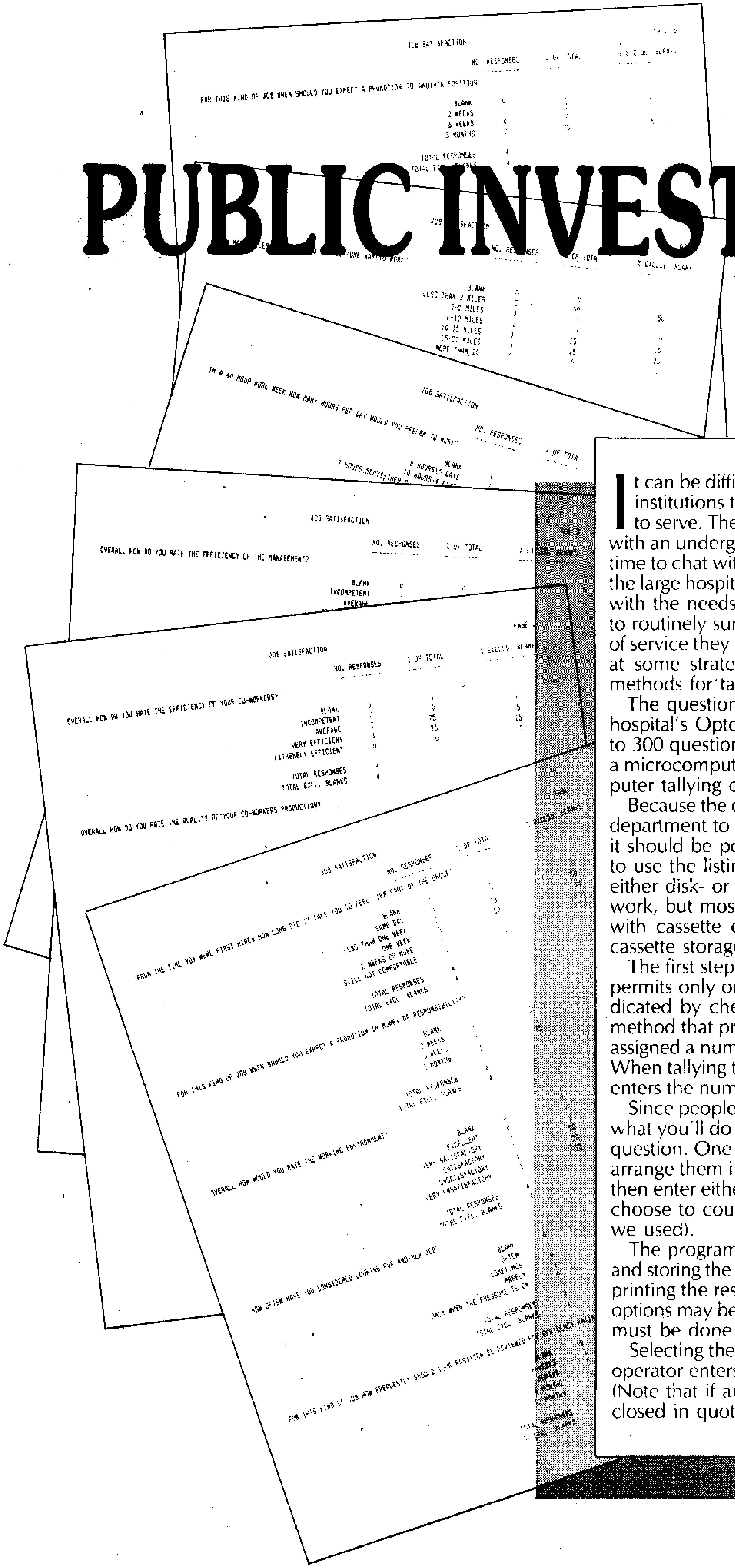
TEX-COMP PRICE
Limited-Time Introductory Offer
$94.95
Including shipping & insurance

$100.00 SPECIAL $100.00
FREE Source/TEXNET
sign on & first hour
with purchase
of Signalman MK III

ACCESSORIES:
9V-DC
Power Supply
$10.95 p.p.

Mail Check or Money Order to: Tex-Comp
P.O. Box 33084, Granada Hills, CA 91344
213-366-6631
VISA/Mastercharge—add 3% for credit card orders. Send Cashiers Check or money order to avoid delay. Calif. orders add 6½% sales tax.

PUBLIC INVESTIGATOR



By David M. Douglas

45-226 Nakuluai St.
Kaneohe, HI 96744

It can be difficult, if not impossible, for administrators of large institutions to keep in touch with the people they are trying to serve. The chancellor of a large university may never speak with an undergraduate. The police commissioner doesn't have time to chat with the cop on the beat. To remedy this situation, the large hospital where I work has taken steps to keep in touch with the needs of its patients. We use written questionnaires to routinely survey the attitudes of patients toward the quality of service they receive from the staff. In this article we will look at some strategies for developing these questionnaires and methods for tallying and evaluating the results.

The questionnaire in Figure 1 is similar to one used in the hospital's Optometry Department. Hand-tallying a set of 200 to 300 questions can be very tedious, so when we purchased a microcomputer, I developed the program listed here for computer tallying of questionnaires.

Because the questionnaires used in the hospital vary from one department to another, the format had to be fairly general. So it should be possible for almost any business or organization to use the listings as they are. The format is compatible with either disk- or cassette-based systems (I had a disk system at work, but most of the writing was done on my home system with cassette only). Considerable effort was made to make cassette storage as efficient as possible.

The first step was designing the questionnaire. This program permits only one answer per question. Answers should be indicated by checking a box, circling a number, or any other method that produces a single defined answer. Each answer is assigned a number, which is printed on the questionnaire form. When tallying the questionnaire on the computer, the operator enters the number of the answer indicated by the respondent.

Since people have a habit of not following directions, decide what you'll do if someone checks two or more answers to one question. One alternative is to assign priorities to the answers, arrange them in order of decreasing or increasing priority, and then enter either the first or the last one checked. Or you could choose to count that question as a blank answer (the option we used).

The program presents a menu with four options: setting up and storing the questionnaire, entering and storing the responses, printing the results, and exiting the program. The three activity options may be done all at the same time or separately, but they must be done in sequence.

Selecting the first option and following the input prompts, the operator enters the questionnaire title, questions and answers. (Note that if any of these contain commas, they must be enclosed in quotation marks to avoid an entry error message.)

The computer prompts the operator with each question, and the operator enters the number of the answer checked on the form. The computer checks to see if it's a valid answer number for that question and beeps if there is an error. If the answer was left blank when something should have been checked, or if the operator cannot tell which answer is indicated, he/she enters a zero (0). On the printed reports these will be tallied as BLANK answers. For some questions, such as question #8 in Figure 1, the answer is supposed to be left blank. For these the operator enters 111 to "skip" that question, and no answer will be tallied. If an answer is designed to terminate the questionnaire in the middle (such as a no response to question #5), the operator enters 999 for the answer to the next question, and the program will skip all the remaining questions for that form.

QUALITY OF SERVICE PROGRAM – PATIENT SATISFACTION QUESTIONNAIRE

Dear Patient:

Our records show that on__________you visited our Optometry Department. Please help us measure and improve our service by taking a few moments to fill out this questionnaire. Your answers will be kept confidential, and a pre-addressed, stamped envelope is provided for you to return it to us. If you have any questions, please contact the Clinic Supervisor, phone 555-0808. Thank you for your assistance.

1. From the time you first contacted us for this appointment how long did you have to wait for an appointment time?

Same Day	1 day	2 days	3 days	4 days	5 days	6 days	1 week
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐
2 weeks	3 weeks	4 weeks	5 weeks	6 weeks	7 weeks	8 weeks	Over 8 weeks
9 ☐	10 ☐	11 ☐	12 ☐	13 ☐	14 ☐	15 ☐	16 ☐

2. For this kind of visit, what do you think is the longest time you should wait for an appointment?

Same Day	1 day	2 days	3 days	4 days	5 days	6 days	1 week
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐
2 weeks	3 weeks	4 weeks	5 weeks	6 weeks	7 weeks	8 weeks	Over 8 weeks
9 ☐	10 ☐	11 ☐	12 ☐	13 ☐	14 ☐	15 ☐	16 ☐

OVERALL, how would you rate the service you received during the visit, by:

	Excellent	Very Satisfactory	Satisfactory	Unsatisfactory	Very Unsatisfactory
3. Receptionist	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Optometrist	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

5. Did you visit our Optical Dispensing Department?

1 ☐ No　　2 ☐ Yes

Please answer the following questions only if you visited our Optical Dispensing Department.

6. The selection of frames was:

Very Good	Good	Fair	Poor	Very Poor
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

7. Did you feel the prices for frames were:

Very Reasonable	Reasonable	About Right	Somewhat High	Much Too High
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

8. If you purchased glasses, did the delivery time seem:

Very Fast	Fast	About Right	Slow	Very Slow
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

9. OVERALL, how would you rate the service you received from Optical Dispensing?

Excellent	Very Satisfactory	Satisfactory	Unsatisfactory	Very Unsatisfactory
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

Figure 1

Tallying Responses

Note that as the responses are entered, the program converts the numbers to letters (0 becomes A, 1 = B, etc., and skipped questions = @). This produces a compact string that can be stored efficiently even on cassette. For example, the questionnaire in Figure 1, with 9 questions, will be stored with 19 forms per record. After all the answers to a form are entered, the operator is given a chance to correct any entry errors. When the answers have been accepted, a prompt line asks if there are more forms to be tallied. Since 99% of the time the operator

FUTURA

SOFTWARE

*The very best in a totally integrated accounting system for your TI99/4A**

Accounts Payable	**$149.95**
Accounts Receivable	**$149.95**
Billing	**$149.95**
General Ledger	**$149.95**
Inventory Management	**$149.95**
Mailing List	**$ 99.95**
Word Processing	**$149.95**

Exclusive Update Service insures against obsolescence of your FUTURA Software.

*Disk-based requiring Extended Basic, 32K Memory Expansion, RS232 interfaced printer.

AUGUST FEATURES

Cassette programs in TI Basic at $19.95 each.

'COPTER CAPERS = Avoid many obstacles as you rescue victims from a burning building and deliver them to the waiting ambulance.

DEATH STATION* = Excellent text — only adventure game challenges you to find fuel at a deserted space station so that you may continue your journey.

MARS MARAUDER = Good navigation skills required as you try landing on Mars.

Cassettes in Extended Basic at $19.95 each.

COSMIC DRIFT = Earth's only space colony depends on you for supplies. Can you deliver?

GETCHA! = They're out to 'getcha' and only with skill and cunning can this unarmed merchant make the aliens destroy each other.

*Also available in Extended Basic.

ORDERING INFORMATION: Payment to accompany order. Add $1.50 for postage. Allow 10 days for delivery.

Write for complete listing of more than 60 programs for the TI99/4A Computer.

EN

Ehninger Associates. Inc.

P.O. Box 5581
Fort Worth, Texas 76108
817-732-1687 or 732-1688

CINTRONICS

"The Printer People"
431 Ohio Pike, Suite 206C
Cincinnati, OH 45230
513/528-6633
Authorized Service Center for C. Itoh

Be assured that Cintronics will not sell you a printer unless it is totally compatible with your TI, Apple, IBM, Osborne, and Commodore Computers. Each printer and cable is pretested before shipment. We will match any legitimate advertised price.

DOT MATRIX PRINTERS*

C. ITOH-One Year Warranty	
Prowriter 8510 Parallel	**389**
Prowriter 8510 Serial	**525**
Prowriter 1550 Serial	**715**
Prowriter 1550 Parallel	**669**
GX-100	**225**
STAR MICRONICS-180 Day Warranty	
Gemini-10	**339**
Gemini-15	**509**

For package including word processing, mail-merge programs and cable add $70 to above prices.

DAISY WHEEL PRINTERS*

C. ITOH-One Year Warranty	
Starwriter F10-40	**1149**
Printmaster F10-55	**1519**
SMITH-CORONA-90 Day Warranty	
TP-1	**499**

Check our special package prices for printer/TI peripheral combinations.

ACCESSORIES**

RS232 or Parallel Cable	**29.95**
Ribbons for C. Itoh Printer	**5.95**
Ribbons for TP-1	**6.95**
Generic Disks SS/SD	**13.95/10**
Elephant Memory System Disks 5¼" SS/SD Box of 10	**17.95**
Elephant Trunk 5¼" Floppy Disk Storage	**21.95**
Head Cleaning Kit (5¼")	**22.95**
Cloth Printer Cover	**10.95**

SHIPPING-Please Include:
*2%
**$1.50 for first item and 25¢ each additional item
Prices shown are for prepaid orders.
Allow 2 weeks for personal checks to clear.
All prices and offers subject to change without notice.

Cintronics is dedicated to provide quality service. We welcome calls for technical assistance.

will want to accept the answers without correction and go on to tally more questionnaires, the program accepts a null entry (pressing the space bar only) as well as Y to indicate yes for these two prompts. Periodically, the computer stores the answers to disk or cassette; this reduces the load on RAM memory, and it is valuable to have the answers stored in case you want to do other types of analysis later on.

If you want to count multiple answers to one question, you can use the 999 and answer correction options. Tally one answer as usual. When the computer asks for answers to the next questionnaire, enter 999 as the answer to the first question. When asked to accept the answers, type N for no, and enter the number of the question with multiple answers. Then enter the number of the next multiple answer.

Last is the print section. If it has already been entered in a previous session, the questionnaire is loaded in from disk or cassette first. (If the questionnaire was loaded in during the response entry, it must be loaded again.) Then the response file is read and tallied, and finally the results are printed out. By adding one or two program lines, specific "profiles" can be printed. For example, to analyze how persons who responded "Unsatisfactory" or "Very Unsatisfatory" to question #9 answered other questions, add this line:

```
1365 IF SEG$(R$(J),9,1)<"E"THEN 1400
```

Now the printed tally will include only people who answered "Unsatisfactory" or "Very Unsatisfactory" to question #9.

After the tally summary is printed, the operator may select any two questions for a cross-tabulation. (This is one of the most tedious tasks in manual tallies.) For example, suppose you are interested in knowing how many people had to wait longer for an appointment than they considered reasonable. This can be determined by cross-tabulating questions 1 and 2. Any number of cross-tabulations may be done, but the computer will have to reread the response file each time. It took less than five minutes to read a total of 250 responses to the questionnaire in Figure 1 from cassette files.

How large a questionnaire the program can handle depends on how many questions and answers there are. The longest I've done with my 16K RAM questionnaire had 19 questions and 122 answers. Since the computer holds only a few responses in memory at a time, it can handle almost any number of responses.

The print format is designed for 132 columns (14 inches at 10 CPI, 8½ inches at 16.5 CPI), with 66 lines per page. You may reduce the width to 80 columns by changing the TAB ()'s in lines 1720 and 1750 to 60 and 65, respectively; abbreviating the column headings and/or eliminating one of the percentage columns, and changing the appropriate tabs set by variable Y.

Array DIMensions are set as follows:

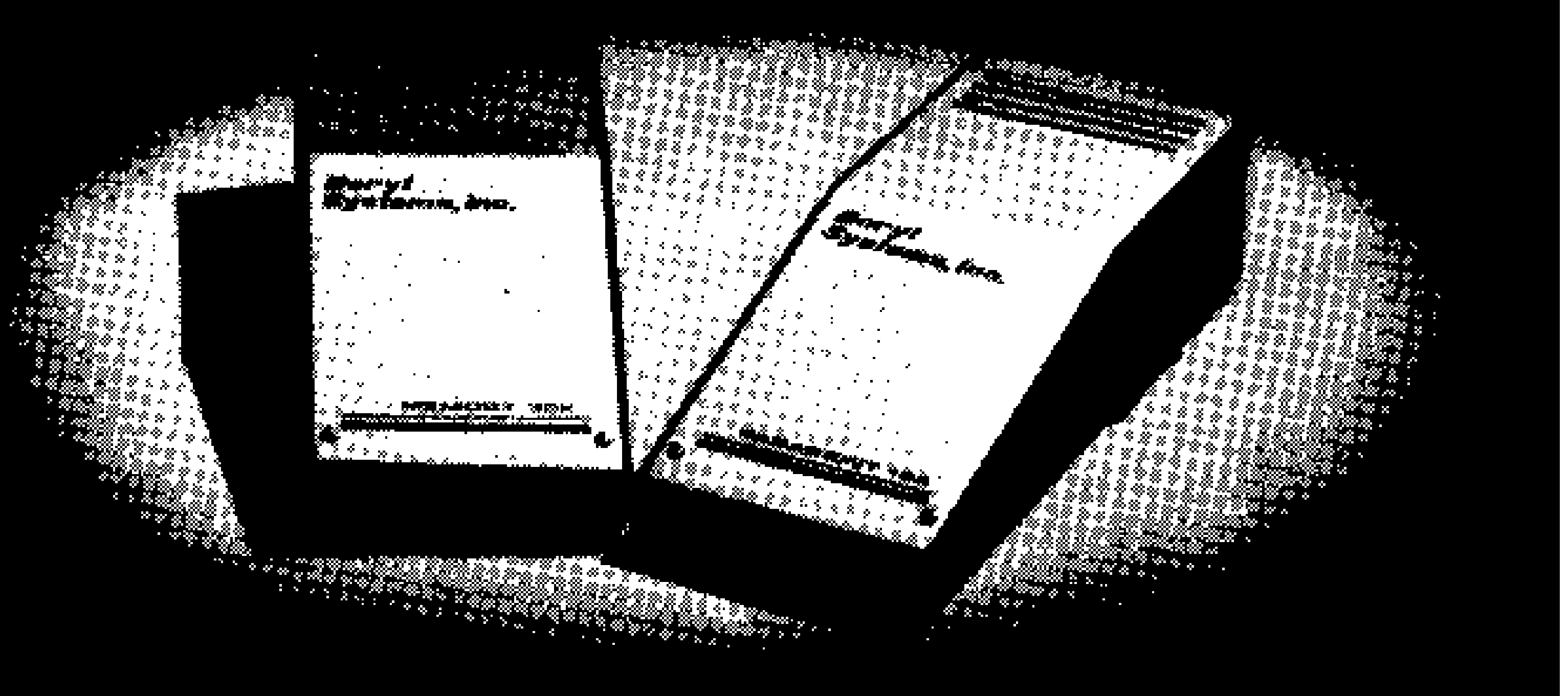
N(X) = number of answers per question; X equals number of questions
Q$(X) = questions; X = number of questions
A$(X) = answers; X = total number of answers in questionnaire + 3
R$(X) = responses; X = integer of 190/(number of questions + 1)
R(X,Y) = tally; X = larger value of number of questions or the largest number of answers to one question + 2; Y = largest number of answers to one question + 2 (the program adds two answers to each question for "skipped" and "blank" answers).

I discovered an interesting bug in TI BASIC. You cannot use a DEFined variable to assign subscripts to data read from files. The logical way to program lines 490 and 500 is:

```
490 FOR J=1 TO B STEP 3
500 INPUT #2:A$(V),A$(V+1),A$(V+2)
```

Defined variable V assigns the correct value, but the strings are all read as null.

The questionnaire can be modified to query customers and employees, to carry out scientific surveys, perform tests, or gather statistics in virtually any setting. It is the perfect vehicle for fast and efficient "mass feedback." And as the number of participants grows, your survey becomes more and more accurate. So the large business, institution, school, or hospital need no longer be synonymous with the impersonal one.



The Doryt Connection: Because you shouldn't have to pay for something you don't need.

Paraprint 18A can save TI-99/4A users up to $300.

Our Paraprint 18A interfaces between the TI-99/4A and any parallel printer, eliminating the need for the TI Peripheral Expansion Box and the RS-232 Interface Card. It plugs directly into the TI-99/4A, is fully compatible and provides daisy chain connection for TI peripherals. And our price is only $105, so you save up to $300 in the bargain!

Doryt also provides savings on additional 32K memory. Ours costs only $175 and you don't have to buy the Peripheral Expansion Box. Plus it plugs directly into the TI-99/4A, is fully compatible with all TI software and provides daisy chain connection for peripheral units.

As a further service, Doryt can provide an economical printer for the system.

Buy the Doryt 18A, 32K memory, printer, and our interconnecting cable and save an additional $50 on the total package! Call collect (516) 676-7950.

Doryt Systems, Inc.
14 Glen Street
Glen Cove, N.Y. 11542
(516) 676-7950.

Dealer inquiries invited.

Public Investigator
Explanation of the Program

Line Nos.	
100-210	Program header and initialize.
220-270	Menu.
280-730	Set up questionnaire.
290-430	Enter title, number of questions, questions, number of answers, answers.
440-620	Proof/correct entries
630-730	Store questionnaire to file
740-1280	Enter responses
740-780	Read questonnaire file if necessary
790-820	Open file to store responses
830-950	Enter responses and edit
960-990	Skip to end of questionnaire
970	Skip one question
980-990	Convert number to letter and add to string
1000-1130	Accept/correct entries
1140-1150	Store response string to pending print file
1160-1190	Check for more forms
1200-1210	Print resonses to file
1220-1280	Set end of file flag; return to menu
1290-2250	Print report
1300-1360	Read questionnaire file, if necessary
1370-1390	Read response file
1400-1480	Tally response
1490-1520	Initialize print section
1530-1890	Print tabular summary report
1900-1960	Print cross-tabulations
1970-2430	Sub-routines
2440-2510	Print page headings
2520-2600	Compute percentages, print numbers
2610-2670	Read questionnaire file
2680-2730	Read response file
2740-2800	Set array=0
2810-2840	Entry error warning
2850-2870	Open print file
2880	End program

```
100 REM ********************
110 REM *  QUESTIONNAIRE   *
120 REM *       BY         *
130 REM * DAVID M. DOUGLAS *
140 REM ********************
150 REM 99'ER VERSION 2.10.1
160 REM 3/16/83
170 OPTION BASE 1
180 DIM N(20),Q$(20),A$(160),R$(70
),R(20,20)
190 DEF U=INT(190/(Q+1))
200 DEF V=A+J
210 CALL CLEAR
220 PRINT "*** QUESTIONNAIRE TALLY
 ***": :
230 PRINT "1 SETUP QUESTIONNAIRE":
 :"2 ENTER RESPONSES": :"3 PRI
NT REPORT": :"4 EXIT": :
240 INPUT "ENTER CHOICE (1-4):":Z
250 IF Z>4 THEN 240
260 CALL CLEAR
270 ON Z GOTO 290,750,1300,2880
280 REM SETUP
290 PRINT "ENCLOSE QUESTIONS, ANSW
ERS &TITLES WITH COMMAS IN QUO
TES": :
300 INPUT "TITLE:":T$
310 INPUT "NO. OF QUESTIONS:":Q
320 A=0
330 FOR I=1 TO Q
340 PRINT :"ENTER QUEST. #";I
350 INPUT "":Q$(I)
360 INPUT "ENTER NO. ANSWERS: ":N(
I)
370 PRINT "ENTER ANSWERS:"
380 FOR J=1 TO N(I)
390 INPUT A$(V)
400 IF LEN(A$(V))<64 THEN 430
410 PRINT :"LINE TOO LONG. REENTER
.": :
420 GOTO 390
430 NEXT J
440 CALL CLEAR
450 PRINT Q$(I)
460 FOR J=1 TO N(I)
470 PRINT "#";J;A$(V)
480 NEXT J
490 INPUT "1=CHANGE QUESTION, 2=CH
ANGE ANSWER, 3=CORRECT:":Z
500 IF Z>3 THEN 490
510 ON Z GOTO 580,520,610
520 INPUT "CHANGE ANSWER #:":J
530 IF J>N(I)THEN 520
540 INPUT "NEW ANSWER:":A$(V)
550 IF LEN(A$(V))<64 THEN 440
560 PRINT :"LINE TOO LONG. REENTER
.": :
570 GOTO 540
580 PRINT :"REENTER QUESTION:"
590 INPUT "":Q$(I)
600 GOTO 440
610 A=A+N(I)
620 NEXT I
630 INPUT "ENTER FILENAME TO STORE
      QUESTIONNAIRE:":Z$
640 OPEN #1:Z$,INTERNAL,OUTPUT,FIX
ED 192
650 PRINT #1:T$,Q,A
660 FOR I=1 TO Q
670 PRINT #1:Q$(I),N(I)
680 NEXT I
690 FOR I=1 TO A STEP 3
700 PRINT #1:A$(I),A$(I+1),A$(I+2)
710 NEXT I
720 CLOSE #1
730 GOTO 210
```

Continued on p. 90

COMPUTER CASSETTES / BASF -DPS

THE WORLD'S FINEST
- Data media for all microcomputers
- Used nationwide by software manufacturers, hobbyists, schools and businesses
- Premium 5-screw shell with leader fits all standard recorders

CASSETTE STORAGE CADDY
NEW! ORGANIZE YOUR TAPES! $2.95 EACH
GET ONE CADDY FREE! Buy 2 doz. Cassettes & One Caddy. Get One Caddy FREE!
OFFER EXPIRES AUGUST 1 1983

FINEST QUALITY PHILIPS (NORELCO) TYPE HARD BOXES

TRACTOR FEED DIE-CUT BLANK CASSETTE LABELS

• SATISFACTION GUARANTEED OR YOUR MONEY BACK •
FOR IMMEDIATE SHIPMENT USE YOUR VISA OR MASTERCARD CALL 213/710-1430

ORDER FORM

ORDER NOW . . . MAIL TO: YORK 10™ Computerware
24573 Kittridge St., #9 9 Canoga Park, CA 91307

ITEM	1 DOZEN	2 DOZEN	TOTAL
C-06	☐ 7.50	☐ 13.50	
C-10	☐ 8.00	☐ 14.40	
C-20	☐ 10.00	☐ 18.00	
Hard Box	☐ 2.50	☐ 4.00	
Storage Caddy $2.95 ea · Quantity ____ FREE · Quantity: ____			
Blank labels ☐ 4.00/100 ☐ 30.00/1000			
SUB TOTAL			
Calif. residents add 6% sales tax			
Shipping/handling 1 doz. $2 2 doz. $3.50 3 doz. $4.50, each additional doz. $.50			
For Parcel Post instead of UPS ADD $1			
Outside Continental USA, ADD $2			
TOTAL			

Check or M.O. enclosed ☐ Charge to Credit Card: ☐ VISA ☐ MASTERCARD
☐ PLEASE SEND QUANTITY DISCOUNTS

Each cassette includes two YORK 10 labels only. Boxes are sold separately. Shipments are by U.P.S. unless Parcel Post requested. Boxes, caddies, and blank labels are free of shipping charges when ordered with cassettes. When ordered without cassettes, shipping charges. Boxes—$1.00 doz., Caddies—$1.00 each. MINIMUM SHIPPING/HANDLING ON ANY ORDER—$2.00.

Name
Address
City State/Zip
Card No. Exp.
Signature

$29.95

The New Disk Minder
- Attractive, functional disk storage
- 75 disk storage capacity
- Easy filing and retrieving
- Index dividers provided
- Easy carrying handle in front of box

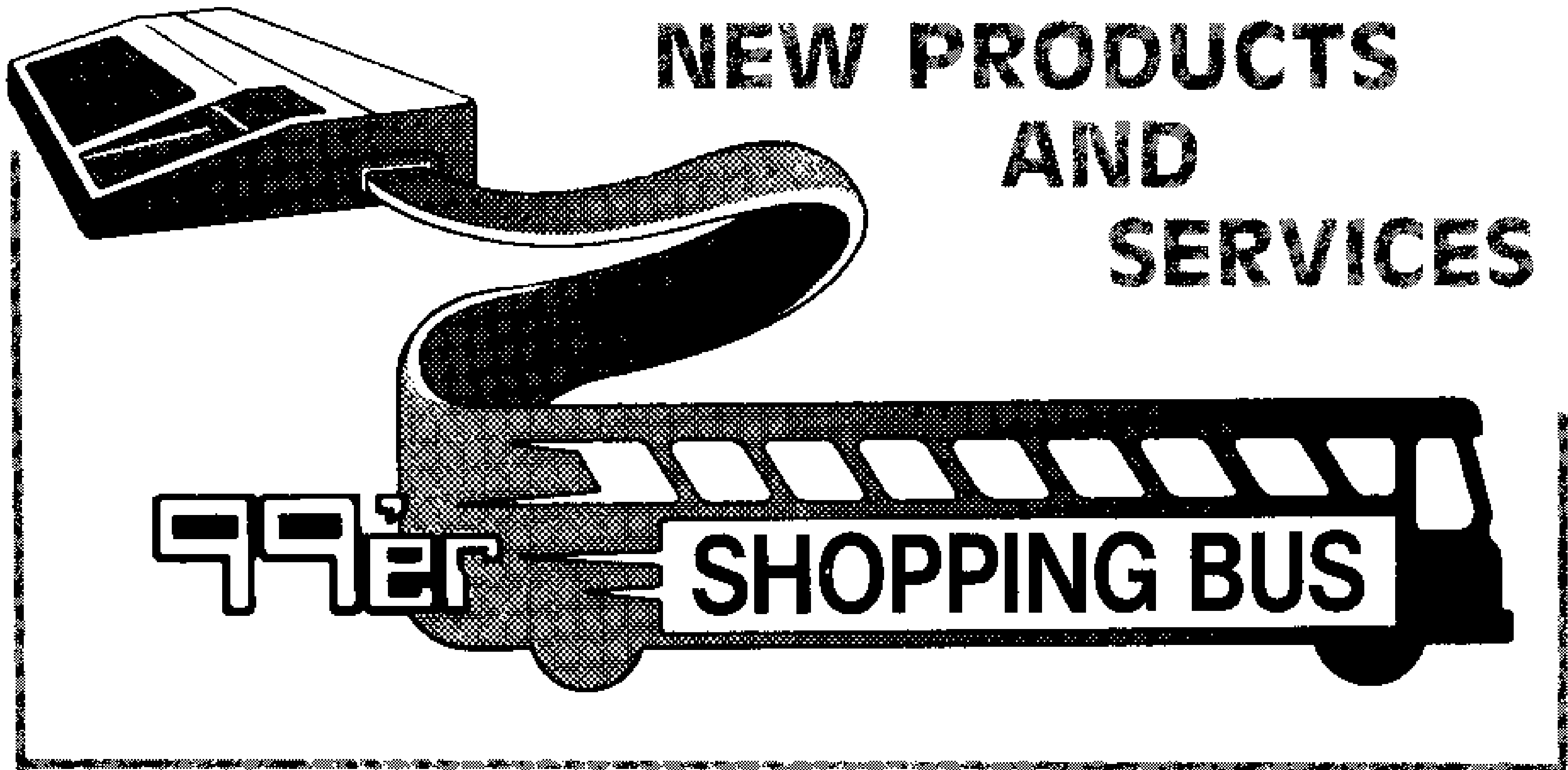
ORDER TOLL FREE 800-227-8292
In Cal 415-969-6600 Use VISA or MasterCard.
Please include $1.95 for shipping and handling.

THE BACH COMPANY
P.O. BOX 51178, PALO ALTO, CALIFORNIA 94303

Investigator . . . from p. 89

```
740 REM ENTER RESPONSES
750 INPUT "ENTER QUESTIONNAIRE FIL
ENAME(IF ALREADY IN MEMORY PRE
SS ENTER ONLY):":F$
760 IF F$="" THEN 790
770 GOSUB 2620
780 CLOSE #1
790 INPUT "ENTER FILENAME TO STORE
 RE- SPONSES:":F$
800 OPEN #4:F$,INTERNAL,OUTPUT,FIX
ED 192
810 CALL CLEAR
820 PRINT T$: :
830 FOR J=1 TO U
840 PRINT "ENTER RESPONSES:"
850 FOR I=1 TO Q
860 PRINT :Q$(I);
870 INPUT "":Z
880 IF Z=999 THEN 930
890 IF Z=111 THEN 970
900 IF Z<=N(I)THEN 980
910 GOSUB 2820
920 GOTO 860
930 FOR I=1 TO Q
940 P$=P$&"@"
950 NEXT J
960 GOTO 1000
970 Z=-1
980 P$=P$&CHR$(Z+65)
990 NEXT I
1000 INPUT "ACCEPT ANSWERS (Y/N)?":
Z$
1010 IF (Z$="")+(Z$="Y")THEN 1140
1020 IF Z$<>"N" THEN 1000
1030 INPUT "CHANGE ANSWER TO QUEST.
 #:":Z
1040 IF Z>Q THEN 1030
1050 PRINT :Q$(Z);
1060 INPUT "":Y
1070 IF Y=111 THEN 1110
1080 IF Y<=N(Z)THEN 1120
1090 GOSUB 2820
1100 GOTO 1050
1110 Y=-1
1120 P$=SEG$(P$,1,Z-1)&CHR$(Y+65)&S
EG$(P$,Z+1,Q)
1130 GOTO 1000
1140 PRINT #4:P$,
1150 P$=""
1160 INPUT "MORE QUESTIONNAIRES (Y
/N)?":Z$
1170 IF Z$="N" THEN 1230
1180 IF (Z$<>"")*(Z$<>"Y")THEN 1160
1190 NEXT J
1200 PRINT #4:""
1210 GOTO 830
1220 J=0
1230 IF J=U THEN 1220
1240 FOR J=J+1 TO U
1250 PRINT #4:"9",
1260 NEXT J
1270 CLOSE #4
1280 GOTO 210
1290 REM PRINT REPORT
1300 INPUT "ENTER QUESTIONNAIRE FIL
ENAME(IF ALREADY IN MEMORY PRE
SS ENTER ONLY):":F$
1310 IF F$="" THEN 1370
1320 GOSUB 2620
1330 FOR I=1 TO A STEP 3
1340 INPUT #1:A$(I),A$(I+1),A$(I+2)
1350 NEXT I
1360 CLOSE #1
1370 INPUT "ENTER FILENAME OF RESPO
NSES:":F$
1380 OPEN #2:F$,INTERNAL,INPUT ,FIX
ED 192
1390 GOSUB 2690
1400 FOR J=1 TO U
1410 IF R$(J)="9" THEN 1480
1420 FOR I=1 TO Q
1430 X=ASC(SEG$(R$(J),I,1))-63
1440 R(I,X)=R(I,X)+1
1450 NEXT I
1460 NEXT J
1470 GOTO 1390
1480 CLOSE #2
1490 GOSUB 2860
1500 L=66
1510 P=0
1520 A=0
1530 FOR I=1 TO Q
1540 IF L+N(I)+6<65 THEN 1570
1550 GOSUB 2450
1560 GOSUB 2480
1570 S=0
1580 FOR J=3 TO N(I)+2
1590 S=S+R(I,J)
1600 NEXT J
1610 T=S+R(I,2)
1620 PRINT #7: :Q$(I): :TAB(70);"BL
ANK";
1630 FOR J=0 TO N(I)
1640 IF J=0 THEN 1660
1650 PRINT #7:TAB(75-LEN(A$(V)));A$
(V);
1660 Z=R(I,J+2)
1670 Y=84
1680 GOSUB 2560
1690 X=T
1700 Y=101
1710 GOSUB 2540
1720 IF J=0 THEN 1760
1730 X=S
1740 Y=124
1750 GOSUB 2540
1760 PRINT #7
1770 NEXT J
1780 PRINT #7: :TAB(60);"TOTAL RESP
ONSES";
1790 Y=84
1800 Z=T
1810 GOSUB 2560
1820 PRINT #7: :TAB(57);"TOTAL EXCL
. BLANKS";
1830 Z=S
1840 GOSUB 2560
1850 PRINT #7: :
1860 L=L+N(I)+8
1870 A=A+N(I)
1880 NEXT I
1890 CLOSE #7
1900 GOSUB 2750
1910 INPUT "CROSS-TAB 2 QUESTIONS (
Y/N)?":Z$
1920 IF Z$="N" THEN 210
1930 IF Z$<>"Y" THEN 1910
```

Continued on p. 92



Send all Press Releases to:

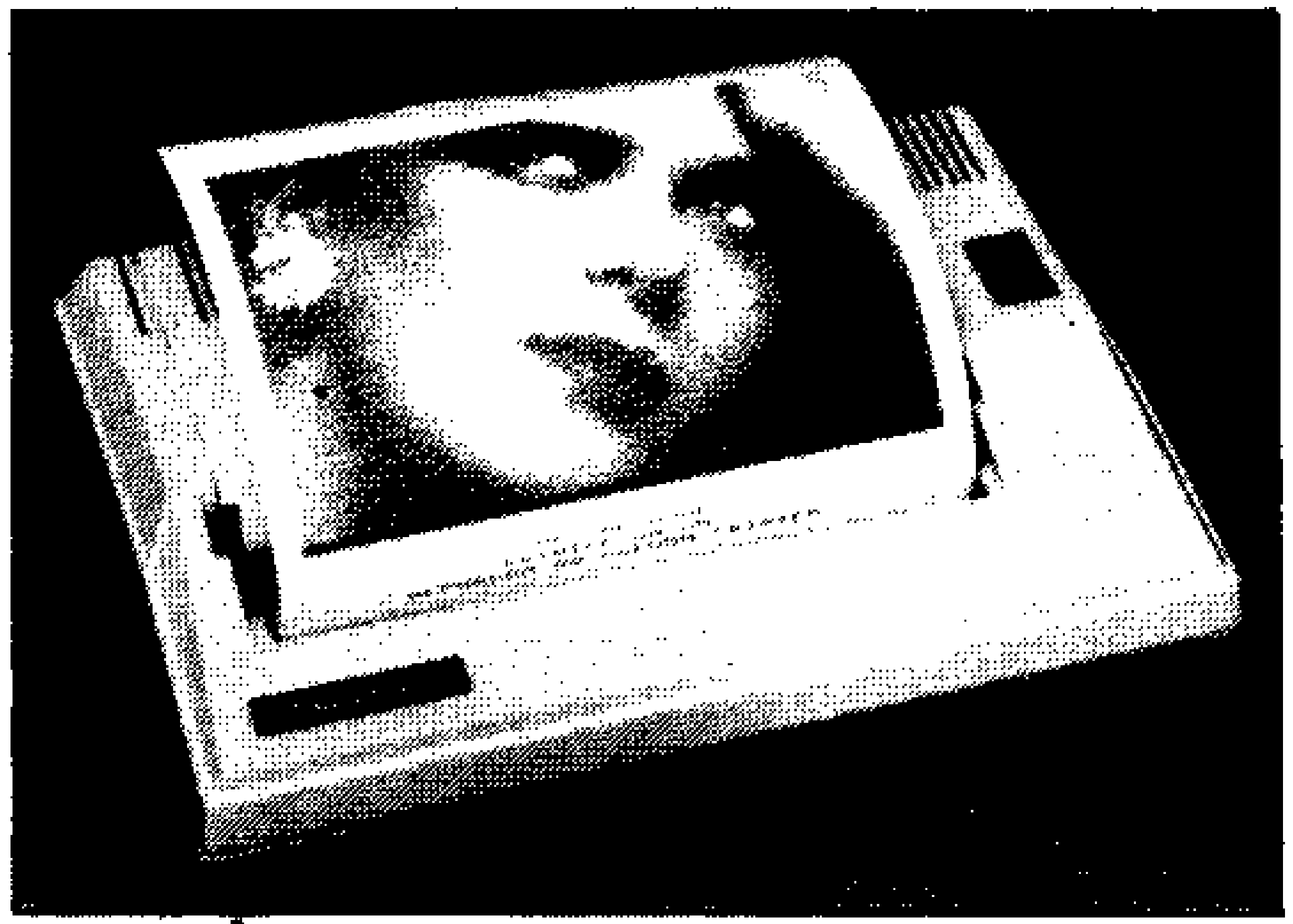
99'er Shopping Bus
Attn: New Products Editor
1500 Valley River Dr., Suite 250
Eugene, OR 97401

ALPHACOM SLASHES PRICES

Alphacom has reduced the price of the Alphacom 42—its 40-column thermal printer with graphics capabilities—from $179.95 to a suggested retail price of $119.95, a decrease of $60.00.

Alphacom has also introduced for September shipment a new 80-column printer with graphics capabilities, the Alphacom 81. It carries a suggested retail price of $169.95. Like the Alphacom 42, the Alphacom 81 features upper and lower case letters, a wrap-around facility (for text longer than 80 columns), and an ability to recognize standard ASCII control or "action" codes for changing the printing modes. Codes include carriage return, line and multi-line feed, right justification, form feed, and graphics control.

For further information, contact the Consumer Sales Department, Alphacom, Inc., 2323 South Bascom Avenue, Campbell, CA 95008. (408) 559-8000.

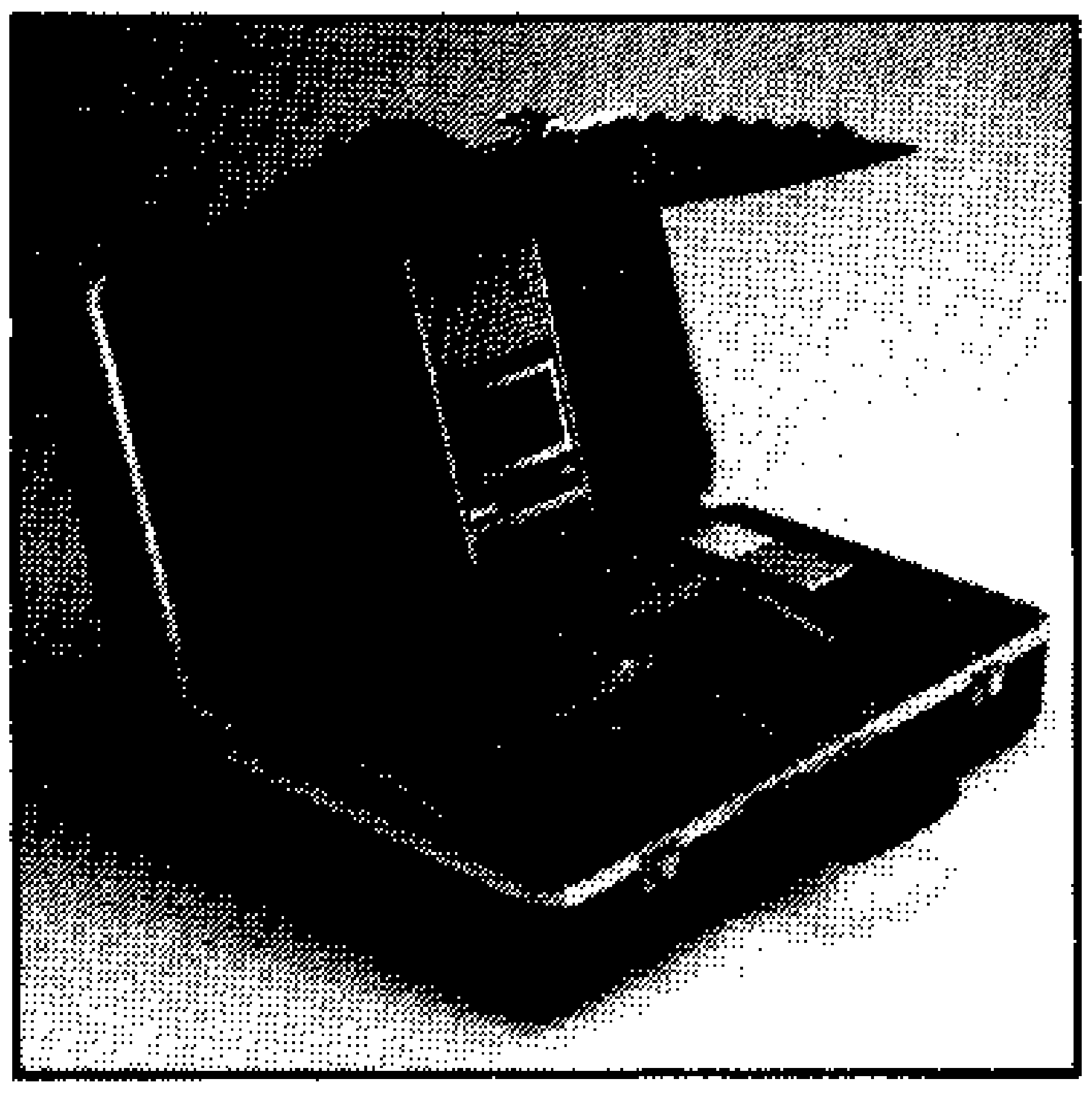


CARRYING CASE FOR THE TI-99/4A

H/S Enterprises has designed a hard carrying case for the TI-99/4A that fits easily under an airline seat, yet carries everything most users need when away from home or office. The only items not accommodated are the CRT monitor and memory expansion accessories.

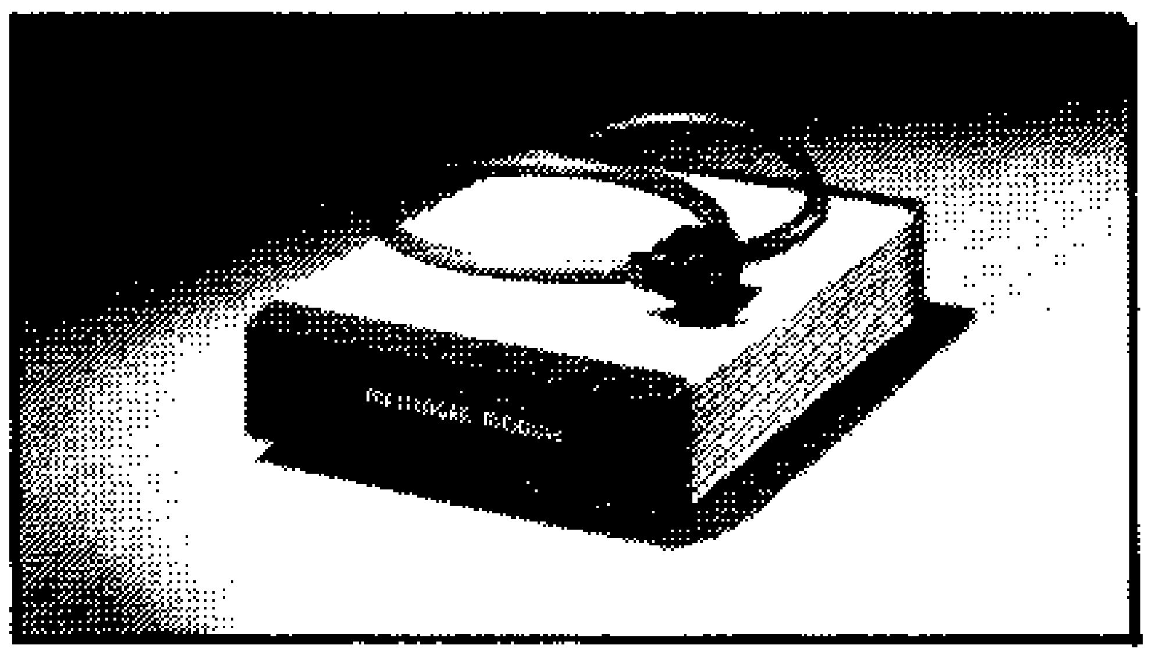
Space utilization is optimal in both the upper and lower compartments of the case, yet all equipment is well-cushioned and readily available. The lower compartment stores the console, speech synthesizer and A/C adapter. The upper case nicely handles a TV modulator, two joysticks, either 14 Command Cartridges/cassette tapes, or a cassette recorder and 7 Command Cartridges/cassette tapes. Cables and books are not forgotten either—they fit nicely in the custom well beneath the console.

The price, $59.95, includes shipping and handling charges inside the continental U.S. (Add $10.00 for foreign shipping and handling.) For more information contact H/S Enterprises, P.O. Box 128, Suffern, New York 10901, (914) 368-1374.



SCOTT, FORESMAN RELEASES *PROBE*

Scott, Foresman and Company, has announced a new *PROBE* series of educational programs in BASIC. Each *PROBE* package contains a student workbook, instructor's edition, diskettes, wall charts, and screen grids. The *PROBE* series for the TI-99/4A will include packages for Primary, Intermediate, and Junior High levels of study. They will cover a wide range of topics in reading and mathematics and will use tutorial, gaming, drill, and practice and simulation modes of computer-assisted instruction. These programs will use the computer fully—incorporating color, graphics, music, sound, and animation. For those who prefer a complete game format, the Scott, Foresman *Mathematics Action Game Series* is available. For further information contact Scott, Foresman and Company, 1900 East Lake Avenue, Glenview, IL 60025, (312) 729-3000.



CP/M PROCESSOR

A new CP/M processor from Morning Star Software will open up many CP/M-based applications possibilities for TI-99/4A users. The CP/M processor contains a 5 MHz 8085 CPU and works with the 99/4A 16-bit TI 9900 CPU. No alterations are needed; the CP/M processor slips into the expansion box. The processor comes with 64K RAM built-in, plus an 8K operating system. For more information contact Morning Star Software, 4325 109th Avenue, Beaverton, OR 97005, (503) 646-4695 or 1-800-824-2412.

FOLLK OFFERS SERVICES

FOLLK (Friends of LISP/LOGO & Kids) a non-profit membership organization promoting the use of microcomputers as independent educational alternatives, is dedicated to bringing "languages for learning" such as LOGO and LISP (and other powerful ideas developed in the Artificial Intelligence field) to people of all ages, interests, and levels of computer expertise. Their projects and services include the FOLLK-Lore newsletter, monthly FOLLK-Meets, curriculum advising for educators, the FOLLK-Net Bulletin Board system, group and individual workshops in LISP and LOGO, and the FOLLK-Flash Hotline Service. For more information, contact FOLLK at 254 Laguna Honda Boulevard, San Francisco CA 94116, (415) 753-6555.

X-BASIC BOOSTER

Computertronics has announced the realease of a series of new programs for the 99/4A. A program called E-Z-DO XBASE will be the flagship offering.

This program allows for the easy use of Extended BASIC for graphics displays, animations, slow-paced games and other programs. E-Z-DO XBASE uses 26 statements and 10 commands that are easy to understand. A statement is entered with an auto numbering feature, then all data is screen prompted with no required punctuation syntax. The data is then stored in a compiled listing to stretch the user memory. The program boasts prudent use of defined variables, 8 defined shape designs (3 can be redefined by user), 8 user-designed sprites, and full use of color. Three Demo programs accompany the package.

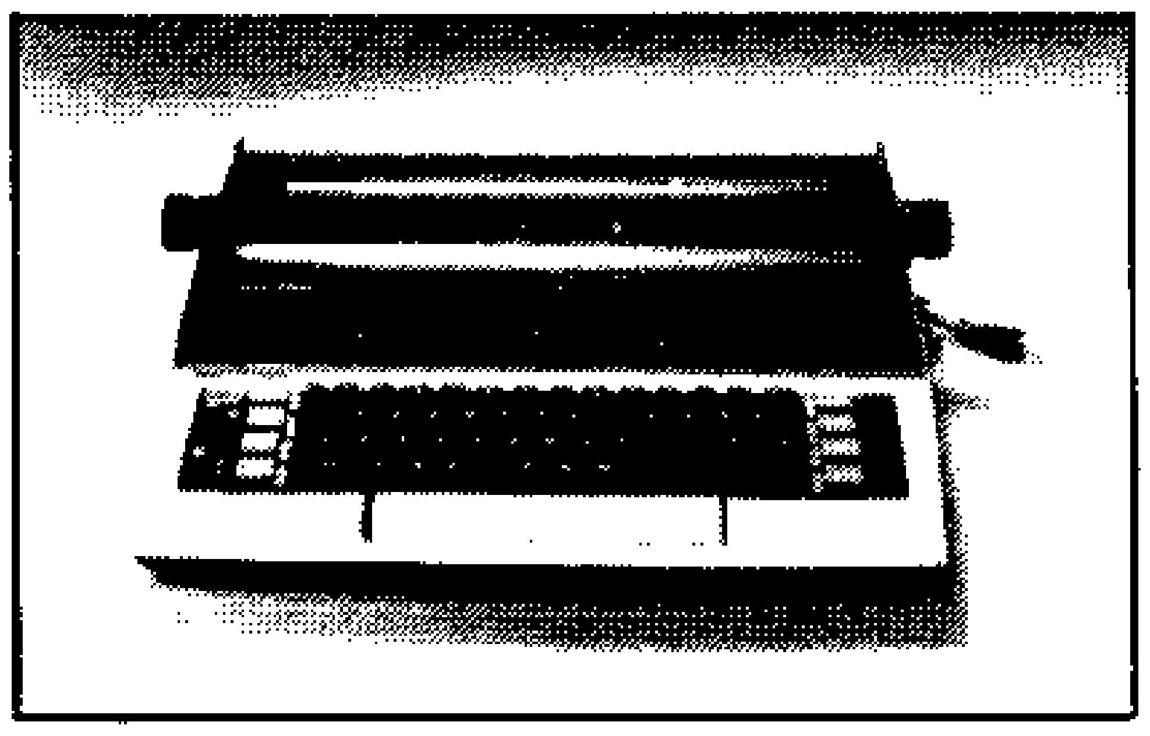
Users need only the TI-99/4A console, Extended BASIC Cartridge, cassette recorder and joysticks. The program is available on cassette for $19.95 from Computertronics, P.O. Box 15823, Plantation, FL 33318.

TYPEWRITER-PRINTERS

The Smith-Corona Group of SCM Corporation has introduced electronic portable typewriters that can double as computer printers with the simple plug-in addition of their optional Messenger Module, or which can be mechanically adapted by authorized Smith-Corona dealers (Memory Correct III). The Memory Correct III Messenger retails for $599; the Citation III Messenger's suggested retail price is $575. The suggested retail cost for the optional Messenger Module (to be available this fall) is $170. The Memory Correct III bears a suggested retail price of $499.

Additionally, Smith-Corona has introduced a printer compatible with most home and small business computers. The TP-II features RS232 Serial and Centronics Parallel interface ports and can print out computer program listings with an ASCII 10/12 pitch printwheel. The suggested retail price for the TP-II is $895.

For more information contact Smith-Corona, 65 Locust Avenue, New Canaan, CT 06840, (203) 972-1471.



!COMPUTERS IN THE CLASSROOM!

PHOTO CONTEST

Teachers, Photographers, and Computer Wiz Kids—you are invited to participate in the first *99'er Home Computer Magazine* Photo Contest! Can you capture those magic moments that brighten up classrooms when children and computers team up to learn? Send your color prints or transparencies to:

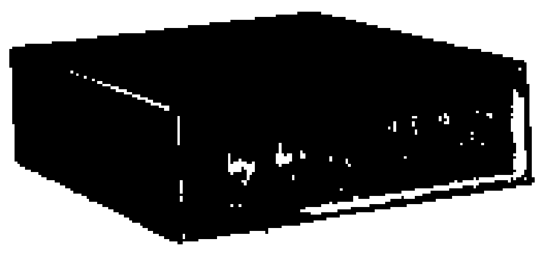
Computers In The Classroom
99'er Home Computer Magazine
1500 Valley River Drive, Suite 250
Eugene, Oregon 97401
before October 14, 1983.

Entries will be judged on:
- Clarity • Originality of concept
- Composition and design.

The Grand Prize Winner will receive a substantial cash prize and may be chosen for placement on a forthcoming cover of *99'er HCM*. First-, Second-, and Third-place prize winners will also be awarded and published.

So, capture those extraordinary child/computer learning teams in that special classroom *now* and send them to us right away. Immortality may be only a photo away!

MAKE CONNECTIONS FAST!
THE DEMON DIALER 176T



NOW
159.95
REG. PRICE $200.00

- Stores and speed dials up to 176 telephone numbers on any tone-service phone system
- Dials numbers up to 32 digits long. Perfect for Sprint, MCI, and all long distance services.
- Repeated redialing of busy numbers for up to 2 hours. Redials unanswered number for up to 10 hours.
- Ideal for use with computer phone modems
- FCC approved and fully guaranteed.

—ORDER NOW—
For fastest delivery, send money order or cashier's check for $159.95 plus $3 shipping and handling ($162.95 total) or use your VISA or Master Card (include card number and exp. date). Personal checks will be held for bank clearance. Kansas residents add 4% sales tax.

AMS Distributors
P.O. Box 4057 • Overland Park, KS 66204
913/642-9744
Bank card phone orders welcome
Dealer Inquiries Invited

Investigator . . . from p. 90

```
1940 INPUT "WHICH QUESTIONS (E.G. 5
     ,9): ":C,B
1950 IF (C>Q)+(B>Q)+(C>=B)THEN 1940
1960 OPEN #2:F$,INTERNAL,INPUT ,FIX
     ED 192
1970 GOSUB 2690
1980 FOR J=1 TO U
1990 IF R$(J)="9" THEN 2050
2000 Y=ASC(SEG$(R$(J),C,1))-63
2010 X=ASC(SEG$(R$(J),B,1))-63
2020 R(X,Y)=R(X,Y)+1
2030 NEXT J
2040 GOTO 1970
2050 CLOSE #2
2060 GOSUB 2860
2070 GOSUB 2450
2080 PRINT #7:"CROSS-TABULATION FOR
     :":TAB(5);Q$(C):TAB(5);Q$(B):
     :
2090 FOR I=1 TO N(C)+1
2100 PRINT #7:TAB(6*I);CHR$(64+I);
2110 NEXT I
2120 PRINT #7
2130 FOR I=2 TO N(B)+2
2140 Z=I-1
2150 Y=3
2160 GOSUB 2560
2170 FOR J=2 TO N(C)+2
2180 Y=6*(J-1)+2
2190 Z=R(I,J)
2200 GOSUB 2560
2210 NEXT J
2220 PRINT #7
2230 NEXT I
2240 GOSUB 2750
2250 A=0
2260 FOR I=1 TO C-1
2270 A=A+N(I)
2280 NEXT I
2290 PRINT #7: :"KEY: ": :Q$(C):"
      A = BLANK"
2300 FOR J=1 TO N(C)
2310 PRINT #7:TAB(5);CHR$(65+J);" =
      ";A$(V)
2320 NEXT J
2330 FOR I=C TO B-1
2340 A=A+N(I)
2350 NEXT I
2360 PRINT #7: :Q$(B):"      1 = BLAN
     K"
2370 FOR J=1 TO N(B)
2380 Y=6
2390 Z=J+1
2400 GOSUB 2560
2410 PRINT #7:" = ";A$(V)
2420 NEXT J
2430 GOTO 1890
2440 REM PAGE HEAD
2450 P=P+1
2460 PRINT #7:CHR$(12):TAB((132-LEN
     (T$))/2);T$;TAB(125);"PAGE";P:
      :
2470 RETURN
2480 PRINT #7:TAB(75);"NO. RESPONSE
     S";TAB(95);"% OF TOTAL";TAB(11
     5);"% EXCLUD. BLANKS"
2490 PRINT #7:TAB(75);"-----------
     -";TAB(95);"-----------";TAB(11
     5);"----------------";
2500 L=4
2510 RETURN
2520 REM COMPUTE %
2530 X=1
2540 IF X=0 THEN 2530
2550 Z=INT(R(I,J+2)*1000/X+.5)/10
2560 IF POS(STR$(Z),".",1)THEN 2590
2570 PRINT #7:TAB(Y-LEN(STR$(Z)));S
     TR$(Z);
2580 RETURN
2590 PRINT #7:TAB(Y+1-POS(STR$(Z),"
     .",1));STR$(Z);
2600 RETURN
2610 REM READ Q FILE
2620 OPEN #1:F$,INTERNAL,INPUT ,FIX
     ED 192
2630 INPUT #1:T$,Q,A
2640 FOR I=1 TO Q
2650 INPUT #1:Q$(I),N(I)
2660 NEXT I
2670 RETURN
2680 REM READ RESPONSE FILE
2690 FOR J=1 TO U
2700 INPUT #2:R$(J),
2710 NEXT J
2720 INPUT #2:Z$
2730 RETURN
2740 REM ARRAY=0
2750 FOR I=1 TO 20
2760 FOR J=1 TO 20
2770 R(I,J)=0
2780 NEXT J
2790 NEXT I
2800 RETURN
2810 REM ERROR
2820 CALL SOUND(200,110,0)
2830 PRINT :"INVALID ENTRY. REENTER
     .": :
2840 RETURN
2850 REM OPEN PRINTER
2860 OPEN #7:"RS232.BA=1200",VARIAB
     LE 132
2870 RETURN
2880 END
```

Purl Two . . . from p. 11

strongly as the program sales. Keil is currently planning a line of children's patterns to be on the market by this summer. Her only problem, she says, is finding more hours in the day to adapt her present programs to all home computers so that she can be free to produce new patterns.

The women agree that the meeting of their respective businesses has been an inspiring and creative experience for them. They look forward to continued success in the knitting pattern market, for they both agree that their only limit is the time that it takes to produce each inventive computer knitting program.

Continued on p. 94

Paneled Skirt Pattern A-Line
Explanation of the Program

Line Nos.	
100-190	Rems.
200-300	Title screen.
310-420	Print special information.
430-440	Input measurements and initialize variables.
450-570	Stitch summary.
580-690	Row summary.
700-960	Skirt shaping.
970-1110	Finishing.
1120-1270	Waist band.
1280-1400	Option to run again.
1410-1550	Error message.
1560	End.
1570-1600	Spacing lines
1610-1820	Finishing.
1830-1930	Hem.
1940-2180	Routine to initialize variables.
2190-2230	Variables for drape.
2240-2280	Variables for hem to hip decreases.
2290-2330	Variables for hip to waist decreases.
2340-2400	Special note for no decreases.
2410-2560	Parallelogram shape.
2570-2770	Routine for part row knitting.
2780-3030	Fashion drape for back.
3040-3360	Input measurements.
3370-3420	Clear screen and print header.
3430-3450	End the screen.
3460-3500	Pause and wait for key to be pressed.

SUBSCRIBE TODAY
SAVE OVER 40% on the SINGLE-COPY PRICE!

RENEW TODAY
DON'T MISS A SINGLE ISSUE!

99'er HOME COMPUTER magazine™ **Subscription**

☐ **NEW SUBSCRIPTION** ☐ **SUBSCRIPTION RENEWAL**

(Allow 6-8 wks for your first issue)

Term	U.S.A	Canada & Mexico	Foreign Surface	Foreign Air
1-yr (12 Issues)	☐ $25	☐ $32	☐ $43	Inquire
2-yr (24 Issues)	☐ $45	☐ $52		
3-yr (36 Issues)	☐ $63	☐ $70		

Please enclose payment in **U.S. FUNDS** or Credit Card billing information as indicated below.

BACK ISSUES AVAILABLE WHILE SUPPLIES LAST

Circle Issues Desired **Vol. 1 No. 6 Nov. '82 Dec. '82 Jan. '83 Feb. '83 Mar. '83 Apr. '83 May '83 Jun '83 Jul '83**

Postpaid
$3.95 ea. USA
$5.50 ea. Foreign Surface
$4.50 ea. Canada & Mexico
$7.50 ea. Foreign Air Mail

TOTAL ____

Bill my: ☐ VISA ☐ Master Card

Account No. ____ ► ____ Expiration Date

Tel. No. ____ Signature ____

RENEWAL SUBSCRIBERS PLEASE INCLUDE INFORMATION BELOW FROM PREVIOUS MAILING LABEL:

____
Subscriber Code Number (line above your name on mailing label)

NAME ____ **PLEASE**
ADDRESS ____ **PRINT**
CITY ____ STATE ____ ZIP ____

Please indicate below any change in name or address.

NAME ____ **PLEASE**
ADDRESS ____ **PRINT**
CITY ____ STATE ____ ZIP ____

Check enclosed ☐ **MUST BE IN U.S. FUNDS DRAWN ON A U.S. BANK**

Address shown is ☐ Business ☐ Home

SUBSCRIPTION BONUS: ***Only Subscribers Will Receive*** **The 99'er BUYERS'S GUIDE** ***Bound Into Each Issue***

____
____
____

PLACE FIRST
CLASS
POSTAGE
STAMP
(CANADIANS,
PLEASE
AFFIX 37¢
POSTAGE)

99'er HOME COMPUTER magazine™

P.O. Box 5537
Eugene, OR 97405

NAME ____ **PLEASE**
ADDRESS ____ **PRINT**
CITY ____ STATE ____ ZIP ____

Check enclosed ☐ **MUST BE IN U.S. FUNDS DRAWN ON A U.S. BANK**

Address shown is ☐ Business ☐ Home

Bill my: ☐ VISA ☐ Master Card

Account No. ____ ► ____ Expiration Date

Tel. No. ____ Signature ____

99'er BOOKSTORE™

QTY	TITLE	PRICE	TOTAL AMOUNT

Shipping and Handling: In U.S.A.—$2.50 for 1 book; 75¢ for each additional book. Foreign Surface—add $3.00 to total U.S.A. shipping costs.

POSTAGE
SUBTOTAL ______

99'er™ MAGAZINE ON TAPE

Circle tapes desired

M1/6, M2/1, M2/2, M2/3, M2/4, M2/5

TOTAL ____

SHIPPING—$1.00 for 1st TAPE, 50¢ ea. add.
Foreign Orders Shipped Airmail—
$3.00 for 1st TAPE, 75¢ ea. add.

SUBTOTAL -----

99'er-ware™

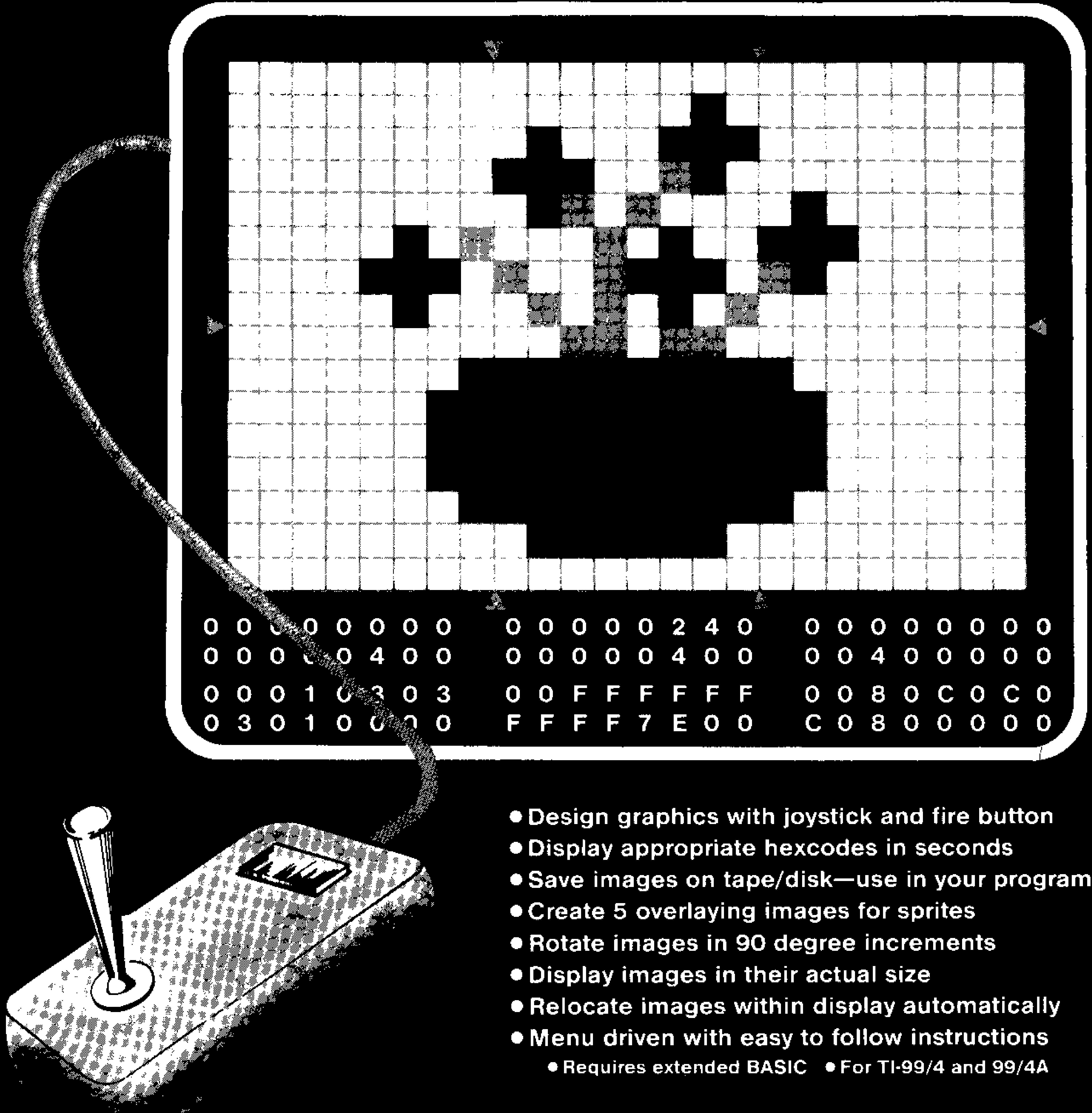
***U.S. ONLY—FOREIGN SURFACE ADD $2.00 TO TOTAL SHIPPING COSTS.**

QTY	ITEM	PRICE	TOTAL AMOUNT
	99'er FINDER – BINDER SHIPPING—$3.00 ea.*	**$11.95**	---------
	6—DIGITAL COMPUTER CASSETTES SHIPPING—2.00 ea.*	**$7.00**	---------
	SPECIAL: 99'er Finder – Binder •with 6 blank cassettes for only .... •with 12 blank cassettes for only .... SHIPPING—$4.00 ea.*	 **$16.95** **$21.95**	---------
	TEX – SETTE ADAPTOR SHIPPING—$1.00 ea.*	**$5.95**	---------
	DUST COVERS: See prices on page 68. Indicate choices below. SHIPPING—$2.00 for 1st COVER, 50¢ ea. add.*		---------
		SUBTOTAL	

TOTAL AMOUNT OF ORDER ____

GRAPHICS CODE GENERATOR

BY: SOFTWARE CAROUSEL



```
0 0 0 0 0 0 0 0   0 0 0 0 0 2 4 0   0 0 0 0 0 0 0 0
0 0 0 0 0 4 0 0   0 0 0 0 0 4 0 0   0 0 4 0 0 0 0 0
0 0 0 1 0 3 0 3   0 0 F F F F F F   0 0 8 0 C 0 C 0
0 3 0 1 0 0 0 0   F F F F 7 E 0 0   C 0 8 0 0 0 0 0
```

- Design graphics with joystick and fire button
- Display appropriate hexcodes in seconds
- Save images on tape/disk—use in your program
- Create 5 overlaying images for sprites
- Rotate images in 90 degree increments
- Display images in their actual size
- Relocate images within display automatically
- Menu driven with easy to follow instructions
  - Requires extended BASIC
  - For TI-99/4 and 99/4A

ORDER YOURS TODAY

CASSETTES:________@ $16.95 = ________

DISKETTES:________@ $19.95 = ________

California residents must add applicable sales tax = ________

SHIPPING & HANDLING *1.50

TOTAL $ ________

Ship To:

NAME ________________

ADDRESS ________________

CITY ________ STATE ________ ZIP ________

*For non-continental USA orders, only money orders or cashier's checks will be accepted. Add $1.00 in shipping charges.

*SEND CHECK OR MONEY ORDER TO:

SOFTWARE CAROUSEL, P.O. BOX 55561, VALENCIA, CA 91355 (805) 254-4141

©SOFTWARE CAROUSEL 1983

COMPLETE SOFTWARE

MINI-PLAN (by M.A. McCreless) **$25**
Extremely powerful electronic spreadsheet program at a 'MINI' price. X-BASIC.

GRAPH-PLAN **$10**
Companion to Mini-plan. Displays financial data in a graphical form. X-BASIC

W.O.R.D. WRITER **$25**
Complete word processor for the TI99/4A. Requires only an RS-232 interface and a printer. BASIC.

BUDGET II/III **$15**
Financial analysis that can be tailored to your individual needs. Specify BASIC or X-BASIC.

THE DUNGEON **$15**
Adventure game for all ages. Never the same game twice! X-BASIC.

GALACTIC BATTLE **$10**
Get them before they get you! X-BASIC.

All programs on cassette.
Send Check or Money Order to:

COMPLETE SOFTWARE
P.O.Box 50886
Nashville, TN 37205

Like us to market your programs?
Write for details.

HOUSEHOLD MONTHLY EXPENSE ANALYZER AND RECORD KEEPER

```
  .
*-*-*-*-*
*-*-*-*-*-*
 [0 0[
 [--[[--[
```

Use this program and your TI computer to help you with your money management and monthly bill paying chores.

You can plan ahead to successfully meet your monthly expenses. It is a proven fact that with proper accounting tools and techniques money can be used much more efficiently in the home.

The author is an experienced Analyst Programmer and wrote it to properly manage his household monthly expenses.

Although the program has many good features it is simple to use and well documented. All you need is your TI 99/4A and a cassette recorder.

SOME OF THE FEATURES ARE AS FOLLOWS:

—Allows you to maintain records of budget and expenses and shows your present status anytime during month.

—You can make up your own budget descriptions and change them anytime to accommodate your current needs.

—Saves and reloads your data to and from cassette; no need to re-enter your budget categories every month.

To order your cassette and program documentation send $23.00 to:

Robert J. Bandin
5891 S.W. 84 Street
Miami, FL 33143

Firefighter Hydraulics Course

A complete, user prompted, program to teach fire service Hydraulics for driver/engineers of fire apparatus.

Teach yourself at home or your entire department, either volunteer or professional!

Includes formulas and "Rough Rule" tables for all sizes of conventional hoses and nozzles as well as for the new light weight, larger size hose and automatic nozzles, computer executes all equations.

Written by a current fire lieutenant, with over 15 years service, expressly for the TI 99/4A

Cassette—$30.00 DISK—$35.00
*no expansion required *requires Ext. BASIC

Send Check or Money Order To:

Fosco Systems Inc.
P. O. Box 4121
Boca Raton, FL 33432

Fla. Residents Add 5% Sales Tax—
Allow 2-3 wks for delivery

INTRODUCTORY SPECIAL FOR 99/4A

Enjoy all the fun of adventuring.

OLD HOTEL Legend has it there's hidden gold—others have searched but never found-that pot of gold.
—EASIER (but not too easy)—

IMPRISONED Although innocent you've been tried & convicted—your only hope-escape & prove your innocence
—HARDER—

HOSPITABOMB A large metropolitan hospital may be destroyed by an extortionists bomb—only you can save it-if you dare.
—HARDEST—

CASSETTE ONLY **TI BASIC** LISTABLE
6.95 EACH ANY 2 $11.95 OR ALL 3 FOR 14.95
+$1 POST & HAND FAST DELIVERY
SEND CHECK OR MONEY ORDER

D&B SOFTWARE
P. O. BOX 2154
COLUMBUS, MISS 39704

Purl Two . . . from p. 92

```
100 REM *********************
110 REM *   BASIC PANELED   *
120 REM *   SKIRT PATTERN   *
130 REM * A FASHION FACTORY *
140 REM *      DESIGN       *
150 REM *   PROGRAMMED BY   *
160 REM *     CUSTOMIZED `  *
170 REM * COMPUTER CONCEPTS *
180 REM *********************
190 REM 99'ER VERSION 2.10.1
200 S$="
        "
210 GOSUB 3370
220 PRINT TAB(11);"LADIES"
230 PRINT
240 PRINT TAB(9);"PANEL SKIRT"
250 PRINT
260 PRINT TAB(11);"PATTERN"
270 PRINT
280 GOSUB 3430
290 GOSUB 1590
300 GOSUB 3460
310 S$="          PLEASE NOTE!"
320 GOSUB 3370
330 PRINT
340 PRINT "ALL MEASUREMENTS SHOULD
     BE"
350 PRINT "TAKEN IN INCHES, NOT ME
    TRIC."
360 PRINT : :
370 PRINT "INFORMATION LISTED IS F
    OR"
380 PRINT "ONE PANEL ONLY!"
390 PRINT
400 GOSUB 3430
410 GOSUB 1570
420 GOSUB 3460
430 GOSUB 3040
440 GOSUB 1940
450 S$="  STITCHES POINT TO POINT"
460 GOSUB 3370
470 PRINT : :
480 PRINT "NO STS AT FLARE:";CO
490 PRINT : :
500 PRINT "NO STS AT HIP:";HP1
510 PRINT : :
520 PRINT "NO STS AT WAIST:";WA1
530 PRINT : :
540 PRINT "NO STS TO DECREASE:";DE
    1+DE2
550 GOSUB 3430
560 GOSUB 1590
570 GOSUB 3460
580 S$="    ROWS POINT TO POINT"
590 GOSUB 3370
600 PRINT "TOTAL ROWS TO KNIT:";LN
    1
610 PRINT : :
620 PRINT "NO ROWS BOTTOM TO HIP:"
    ;BH1
630 PRINT : :
640 PRINT "NO ROWS HIP TO WAIST:";
    HL1
650 PRINT : :
660 PRINT "NO ROWS IN WAIST BAND:"
    ;BA1
670 GOSUB 3430
680 GOSUB 1570
690 GOSUB 3460
700 S$="          SHAPING HEM"
710 GOSUB 3370
720 GOSUB 1830
730 GOSUB 2190
740 GOSUB 2780
750 PRINT
760 GOSUB 3430
770 GOSUB 1570
780 GOSUB 3460
790 GOSUB 2240
800 S$="  SHAPING HEM TO HIPLINE"
810 GOSUB 3370
820 GOSUB 2410
830 GOSUB 3430
840 GOSUB 1570
850 GOSUB 3460
860 S$="   SHAPING HIP TO WAIST"
870 GOSUB 3370
880 GOSUB 2290
890 IF DE2=0 THEN 900 ELSE 920
900 GOSUB 2340
910 GOTO 930
920 GOSUB 2410
930 GOSUB 3430
940 GOSUB 1570
950 PRINT
960 GOSUB 3460
970 GOSUB 1700
980 S$="          FINISHING!"
990 GOSUB 3370
1000 PRINT
1010 PRINT "SEAM TO FORM A FRONT AN
    D"
1020 PRINT
1030 PRINT "BACK SECTION OF SKIRT."
1040 PRINT
1050 PRINT "HANG WAIST OF SKIRT FRO
    NT"
1060 PRINT
1070 PRINT "TO";WA2;"STS."
1080 PRINT
1090 GOSUB 3430
1100 GOSUB 1570
1110 GOSUB 3460
1120 GOSUB 3370
1130 PRINT
1140 PRINT "KNIT";BA1;"ROWS OF BAND
    "
1150 PRINT
1160 PRINT "MARKING FIRST ROW."
1170 PRINT
1180 PRINT "KNIT ONE ROW LOOSE TENS
    ION."
1190 PRINT
```

N E T W O R K A N A L Y S I S
on the TI 99, 59 or HP 85

NETAN calculates and plots frequency response (Gain and phase), input and output impedances of almost any linear electrical network.

Ideal for design of active and passive filters, RF circuits, attenuators, etc.

Up to 100 circuit elements may be entered in a unique, simple to use "building block", fashion. Elements can be active or passive, including transistor and Op amp models.

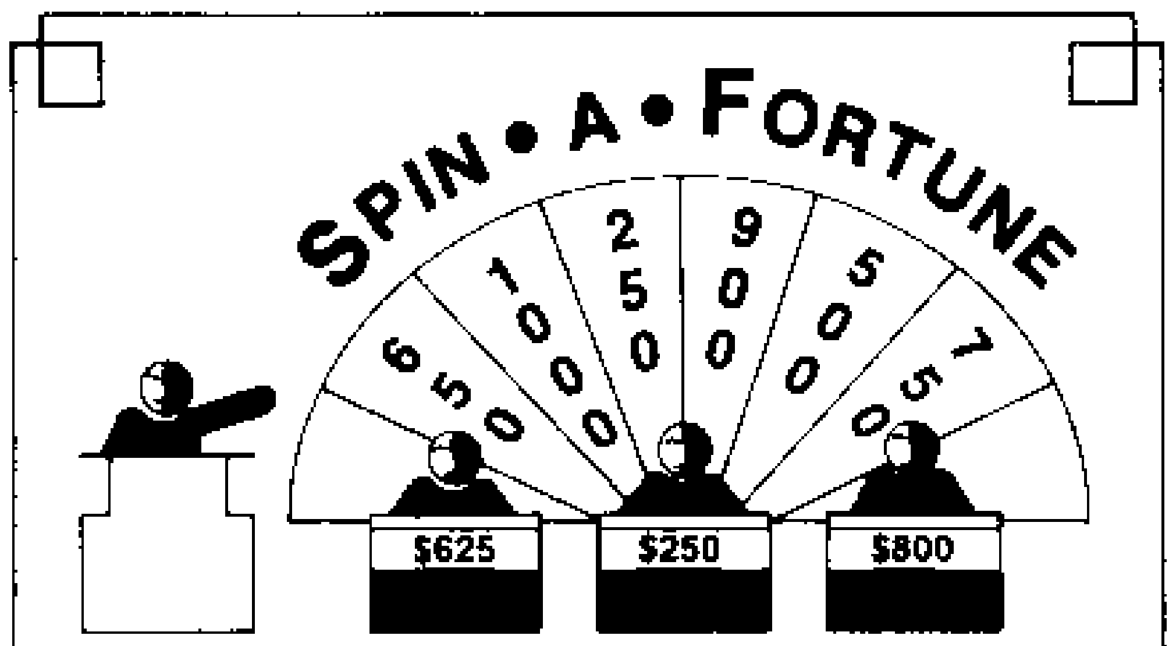
See designer's article for similar technique on TI 59 published in "Electronic Design", P191, APR 26, 80.

Contains Network Editor and ability to store networks on tape for future use.

Results may be displayed on screen and RS232 or Thermal printer.

Manual only: $10. Specify TI 99, 59 or HP 85.
Cassette only: $35
Mag. cards (TI 59): $10
Also available:-
"Convert Poles and Zeros to Function of Time" program.
Cassette and Manual: $15 ($5 when ordered with NETAN Cassette).
Mag cards, (TI 59): $10
XBASIC required for both programs.

C. Gyles, 40 Pine Plain Road,
Boxford, MA 01921
Send Check or Money Order.



The first TV game show simulation for the 99/4 (A) Spin the money wheel, guess letters and solve the puzzles for big payoffs in fun and excitement. The whole family will love **SPIN • A • FORTUNE**. Not just another computer game.

- 160 Puzzles in "INVISIBLE" Data List (can't be read by listing program)
- 2nd Cassette contains 100 more puzzles on file
- make your own files - never run out of puzzles
- Unique circular effects—graphics—color—sound

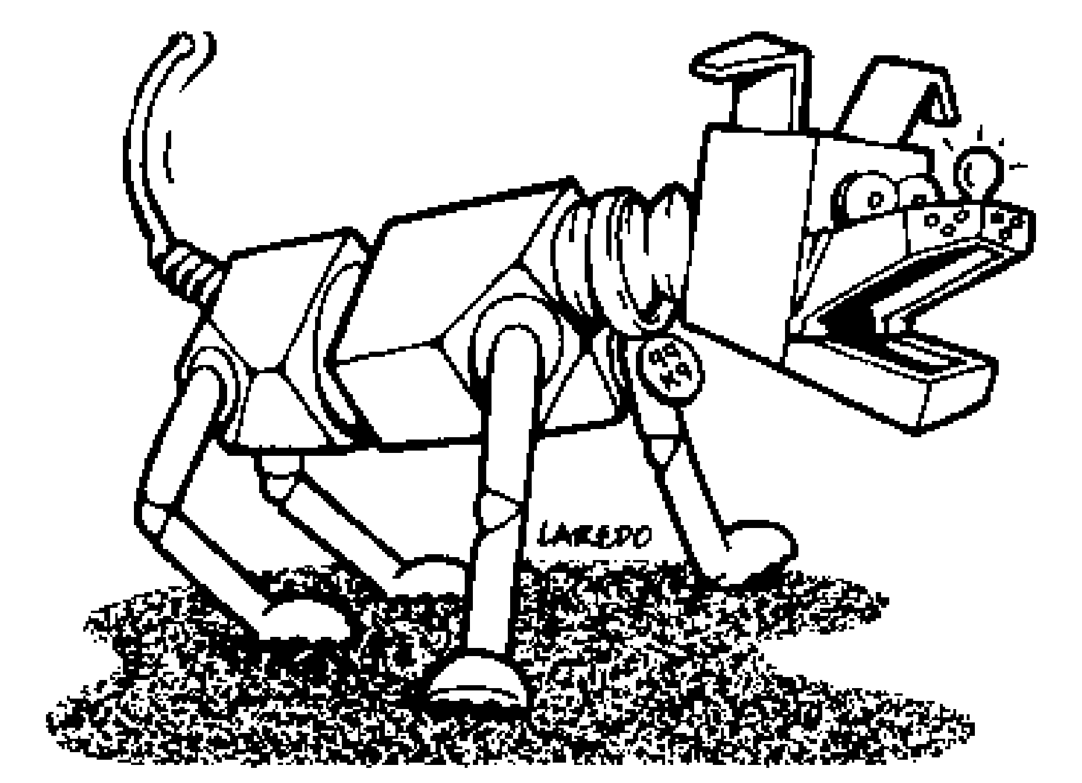
ONE OF THE MOST ENTERTAINING PROGRAMS AVAILABLE IN TI BASIC

For 2-4 Players. Requires no peripherals except cassette recorder

SUNRISE SOFTWARE
P.O. Box 5010
Springfield, Va. 22150

2 CASSETTE TAPES

$12.95
+$1 shipping



B.A.R.C.* BACK

***(Best Article-Reader's Choice)**

Let us know what *you* like by voting for your favorite article or program in this month's 99'er Home Computer Magazine. Fill out the removable B.A.R.C. BACK response card on the bottom of the 99'er Questionnaire and mail it in. (There is no need to fill in the 99'er Questionnaire again, if you have already done so.) Let your voice be heard—the winning author will receive a bonus of $100.00!

```
1200 PRINT "KNIT";BA1;"ROWS FOR FAC
ING."
1210 PRINT : :
1220 PRINT "LACE OFF TO MARKED ROW.
"
1230 PRINT
1240 PRINT "REPEAT INST. FOR BACK."
1250 GOSUB 3430
1260 PRINT : :
1270 GOSUB 3460
1280 S$="
  "
1290 GOSUB 3370
1300 PRINT
1310 PRINT "       SKIRT COMPLETE"
1320 PRINT "       END OF PROGRAM"
1330 PRINT : :
1340 GOSUB 3430
1350 GOSUB 1570
1360 PRINT
1370 PRINT "RUN AGAIN? (Y/N) "
1380 CALL KEY(3,KEY,STATUS)
1390 IF STATUS=0 THEN 1380
1400 IF KEY=78 THEN 1560 ELSE 200
1410 S$="      PROGRAM ABORTED"
1420 GOSUB 3370
1430 GOSUB 1590
1440 PRINT TAB(8);"PLEASE NOTE!"
1450 PRINT
1460 PRINT "A MEASUREMENT HAS BEEN"
1470 PRINT "ENTERED THAT IS INCOMPA
TIBLE"
1480 PRINT "WITH PROGRAM."
1490 PRINT
1500 PRINT "REFER TO INSTRUCTION BO
OK-"
1510 PRINT "LET FOR ERROR DETAILS."
1520 GOSUB 3430
1530 GOSUB 1570
1540 GOSUB 3460
1550 GOTO 1280
1560 STOP
1570 PRINT : : : :
1580 RETURN
1590 PRINT : : :
1600 RETURN
1610 S$="      PLEASE NOTE!"
1620 GOSUB 1590
1630 PRINT "     REFER TO INSTRUCTIO
N"
1640 PRINT "      BOOKLET FOR SKIRT"
1650 PRINT "         FINISHING"
1660 GOSUB 1590
1670 GOSUB 3430
1680 GOSUB 3460
1690 RETURN
1700 S$="      PLEASE NOTE!"
1710 GOSUB 3370
1720 GOSUB 1570
1730 PRINT "TAKE PANEL OFF ON WASTE
"
1740 PRINT "YARN."
```

```
1750 PRINT
1760 PRINT "REPEAT ALL INSTRUCTIONS
"
1770 PRINT "FOR";PA-1;"MORE PANELS.
"
1780 GOSUB 1570
1790 GOSUB 3430
1800 GOSUB 1590
1810 GOSUB 3460
1820 RETURN
1830 PRINT "CAST ON";CO;"STITCHES"
1840 PRINT
1850 PRINT "KNIT";HM1;"ROWS FOR HEM
 FACING"
1860 PRINT
1870 PRINT "SET RC000"
1880 PRINT
1890 PRINT "KNIT ONE ROW LOOSE TENS
ION"
1900 PRINT
1910 PRINT "HANG HEM ON ROW";HM1+1
1920 PRINT
1930 RETURN
1940 CO=INT((((HP+FL)*SG)/PA)+.5)
1950 IF CO/2<>INT(CO/2)THEN 1960 EL
SE 1970
1960 CO=CO+1
1970 HP1=INT(((HP*SG)/PA)+.5)
1980 IF HP1/2<>INT(HP1/2)THEN 1990
ELSE 2000
1990 HP1=HP1+1
2000 WA1=INT(((WA*SG)/PA)+.5)
2010 IF WA1/2<>INT(WA1/2)THEN 2020
ELSE 2030
2020 WA1=WA1+1
2030 LN1=INT(LN*RG)
2040 HM1=INT(HM*RG)
2050 HL1=INT(HL*RG)
2060 BA1=INT(BA*RG)
2070 DE1=INT(CO-HP1)
2080 IF DE1/2<>INT(DE1/2)THEN 2090
ELSE 2100
2090 DE1=DE1+1
2100 DE2=(HP1-WA1)
2110 IF DE2<2 THEN 2120 ELSE 2140
2120 DE2=0
2130 GOTO 2160
2140 IF DE2/2<>INT(DE2/2)THEN 2150
ELSE 2160
2150 DE2=DE2+1
2160 BH1=LN1-HL1
2170 WA2=INT((WA1*PA)/2)
2180 RETURN
2190 BR=HM1+2
2200 RW=4
2210 SW=INT(CO/4)
2220 E$="DRAPE"
2230 RETURN
2240 BR=HM1+2
2250 SW=INT(DE1/2)
2260 RW1=BH1
2270 RW=BH1-BR
```

```
2280 RETURN
2290 BR=INT(BH1+1)
2300 SW=INT(DE2/2)
2310 RW1=HL1
2320 RW=HL1-1
2330 RETURN
2340 PRINT "         PLEASE NOTE!"
2350 PRINT
2360 PRINT "THERE WILL BE NO DECREA
SES"
2370 PRINT "FROM THE HIP TO THE WAI
ST."
2380 PRINT : :
2390 PRINT "KNIT EVEN TO ROW";LN1
2400 RETURN
2410 ST1=INT(RW/SW)
2420 RE=INT(RW-(ST1*SW))
2430 IF RE=0 THEN 2440 ELSE 2460
2440 RE1=SW
2450 GOTO 2480
2460 RE1=SW-RE
2470 PRINT
2480 PRINT "STS TO DEC EACH SIDE";S
W
2490 PRINT : :
2500 PRINT "DEC 1 ST/";ST1;"RS/";RE
1;"TIMES"
2510 IF RE<>0 THEN 2520 ELSE 2540
2520 PRINT : :
2530 PRINT "DEC 1 ST/";ST1+1;"RS/";
RE;"TIMES"
2540 PRINT : :
2550 PRINT "BEGIN DEC ROW";BR+ST1
2560 RETURN
2570 RW=INT(RW/2)
2580 ST1=INT(SW/RW)
2590 RE=INT(SW-(ST1*RW))
2600 IF RE=0 THEN 2610 ELSE 2630
2610 RE1=RW
2620 GOTO 2640
2630 RE1=RW-RE
2640 PRINT "BEGIN SHORT ROW ON ROW"
;BR
2650 PRINT "FOR ";E$;" SR ARE NOT"
2660 PRINT "COUNTED IN TOTAL ROWS."
2670 IF ST1<=0 THEN 2680 ELSE 2700
2680 RE=RE1+RE
2690 GOTO 2740
2700 PRINT
2710 PRINT "PLACE";ST1;"STS INTO H/
P";RE1
2720 PRINT "TIMES"
2730 IF RE<>0 THEN 2750 ELSE 2770
2740 PRINT
2750 PRINT "PLACE";ST1+1;"STS INTO
H/P";RE
```

Continued on p. 98

WE CHALLENGE YOU TO COMPARE —

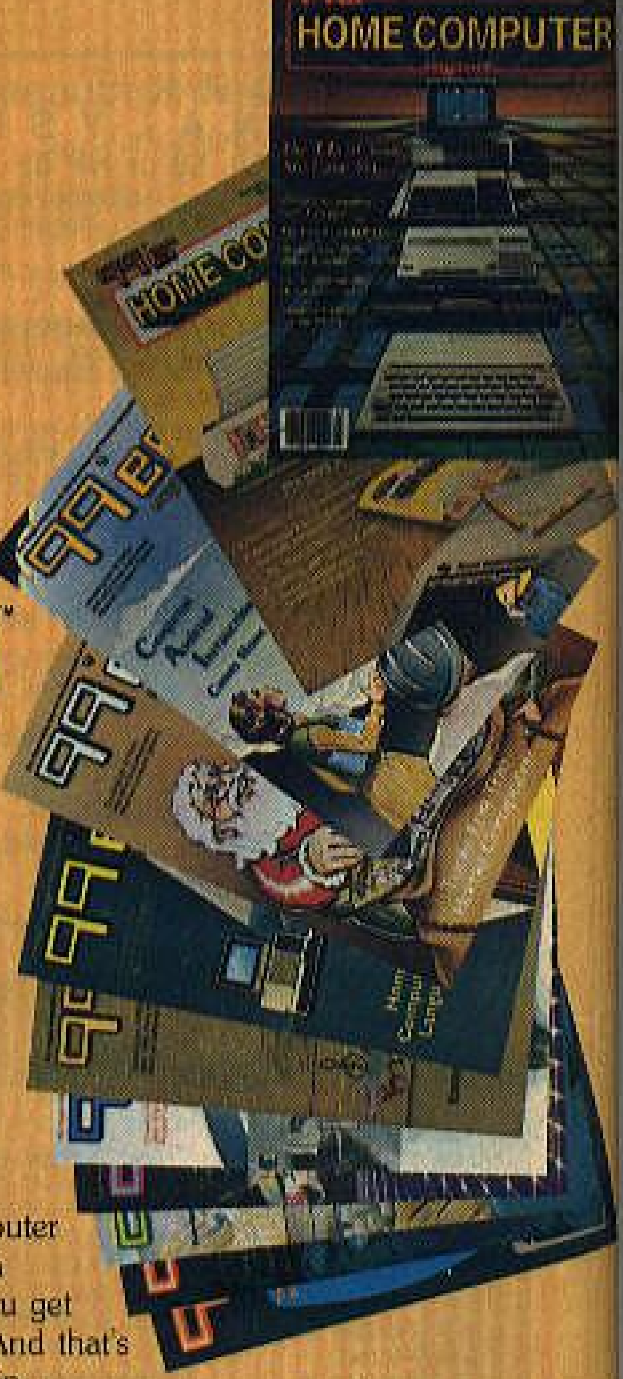
Try To Find Any Other Home Computer That Gives You More For Your Money Than Texas Instruments . . .

. . . Or Any Other Magazine That Helps You Benefit More From a Home Computer Than 99'er HOME COMPUTER magazine™

There Are None!

THAT'S WHY THE EXPERTS SAY:

Once You Compare — There's No Comparison℠



Finding the best deal in a Home Computer isn't the whole story. You also need a timely information resource to help you get the maximum value out of your purchase. And that's where *99'er Home Computer Magazine* fits in . . .

As the *ONLY* magazine exclusively for the Texas Instruments brand of home, personal, and portable computers—including the versatile 16-bit TI-99/4A Home Computer, the TI-99/2 Basic Computer, and the battery-powered Compact Computer series—*99'er Home Computer Magazine* is a MUST for all current users interested in entertainment, education, business, professional, and home applications. Also, it is an essential evaluation resource for those who want to know more about the friendly, value-packed TI computers in order to make intelligent purchase decisions in the future . . .

A Unique Combination of Resources

As a bonus, *99'er Home Computer Magazine* contains several special-interest supplement *LOGO Times*—a journey of applied imagination, exploration, and self-discovery throug the TI LOGO language environment; *Computer Gaming*—a treasure-trove of fun, exci ment, and strategy; *Portable Computing*—an applications compendium for transportab computing power; and *PLATO Progress*—a valuable users guide to an extensive computer-assisted learning library.

A Multi-Level Teacher, News Medium, & Buyer's Guide With Lots of FREE Software

Each BIG monthly issue of *99'er Home Computer Magazine* contains tutorials and applications for beginners, tips and "How-To" articles for intermediate-level users, advance programming techniques that keep the pros coming back for more, as well as *half a dozen* ready-to-run computer programs for EVERYONE. Additionally, there are photos and news items from shows where TI exhibits its products; advertisements from the leading producers and vendors of TI and TI-compatible software, hardware, and accessories; p in-depth descriptions and reviews of the latest products and books—timely information keep readers well informed and help them make wise purchase decisions.

99'er HOME COMPUTER magazine™

. . . From The People Who Know The Home Computer Best

SATISFACTION GUARANTEED

Or the Unfilled Portion of Your Subscription Will Be Refunded

☐ **YES—Please sign me up as a subscriber. Enclosed is payment or credit card billing information.**

Term	U.S.A.	Canada & Mexico	Foreign Surface	Foreign Air
1-yr (12 issues)	☐ **$25**	☐ **$32**	☐ **$43**	**Inquire**
2-yr (24 issues)	☐ **$45**	☐ **$52**		
3-yr (36 issues)	☐ **$63**	☐ **$70**	Sample Issue	☐ **$3.95**

☐ Check or Money Order enclosed
(MUST BE **IN U.S. FUNDS** DRAWN ON U.S. BANK)

Name ______________________ **PLEASE**

Address ______________________ **PRINT**

City __________ **State** ________ **Zip** ________

Bill my: ☐ **VISA** ☐ **Master Card**

► **Expiration Date** ______________________

Signature ______________________

Charge Card Number: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Please Mail Your Order To: ►

99'er Home Computer Magazine
P. O. Box 5537
Eugene, OR 97405

Credit card phone order call:

Tel. (503) 485-8796 WEST COAST TIME

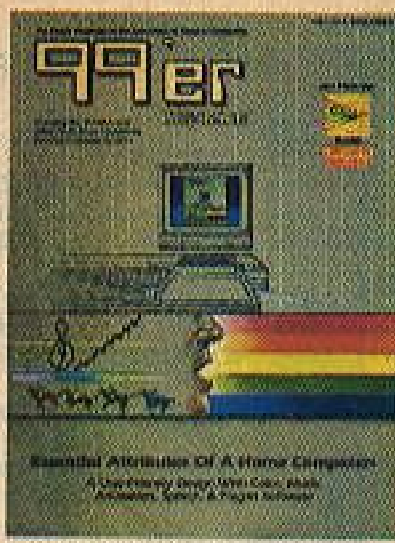
Business Hours: 8:00 AM – 5:00 PM

℠ A service mark of Emerald Valley Publishing Co.

Copyright © 1983 by Emerald Valley Publishing C

Mid-Summer BACK ISSUE *Warehouse Clearance Sale*

Vol. 1, No. 6 Only $2.00 While Supply Lasts (see details)



Rapid growth has placed a great premium on our available warehouse space. To free up some room for our new stock of software and books, we are making the following limited-time offer: With the purchase of any back issue of 99'er Home Computer Magazine, you may purchase Vol. 1, No. 6 for ONLY $2.00 while the supply lasts. This unique issue provides a colorful spectrum of programs and informative articles on the essential attributes of the Home Computer. Take a look at this bonus-filled magazine:

ISSUE #6 (Partial Contents) How to Produce Sensational Sound Effects • Debugging a Game Program • How to Start a Users Group • Verbose: A Speech Vocabulary Expansion Aid • Color Mapping Your Data for Visual Impact • Dynamic Manipulation of Character Graphics for Screen Pictures the Quick & Easy Way • The Beginner's Guide to Cassette Operation With the Home Computer • Preschool Block Letters and Data Compaction • Picking the Ponies in TI BASIC • Battle Star Space Game • 3-D Animation on the Home Computer • Programming Tips • Who Is LOGO For? • Tower of Hanoi in TI LOGO • A Review of the TI Lesson Development Software • An Interview with a Game Designer • Learning Assembly Language with a Magic Crayon • and much, much, more.

Volume 1, No. 6 was the last of the big 100-page bimonthly issues—very likely to become a much sought-after "Collector's Copy" in the future . . . Don't Miss Out! Get your half-price copy while the supply lasts!

Back Issues of

99'er HOME COMPUTER magazine™

are Still Available . . . but quantities are limited

so ORDER TODAY!

Each Only $3.95 postpaid

ISSUE #1 ISSUE #3 ISSUE #5
ISSUE #2 ISSUE #4
OUT OF PRINT

NOVEMBER 1982 (Partial Contents)
• Chatting with Your Micro: Languages for the Home Computer • A Review of the Smith Corona TP-1 Daisy Wheel Printer • The Micro Jaws Arcade Game • A Knight's Tour in TI BASIC • LOGO Has Style • ASPIC: A Language for Children • A p-System Beginners' Tutorial • An Interview with a p-System Pioneer • A Mini-Memory Screen Dump to the Home Computer Printer • Up Scope!—An exciting Undersea Combat Game • Strategy for Munch Man • A Brief Encounter with a TI Hand-Held Computer • 99'er Shopping Bus • A Pocket Battleship • Sub-Programs in Extended BASIC • Arcade & Adventure Game Reviews • and much, much more.

DECEMBER 1982 (Partial Contents)
• Tex-Scribe: A Text Editor for the Home Computer • A Christmas Computer Carol • Managing a Mailing List the Futura Way • Parsec: The Arcade Game • Plotting With the Home Computer—Pixel by Pixel • Preventing the Situation—Oh No! Memory Full • A Colorful Tour of TI-Fest: The Home Computer Show • Santa's Workshop: The Making of a Home Computer • The Turtle Arcade: Movies & Video Games in LOGO • Controlling a BASIC Termite • The 99'er Gold Rush—An Arcade/Adventure in the Home • 99'er Digest of News & Happenings in the TI World • Plus Games, Reviews, and much, much more.

JANUARY 1983 (Partial Contents)
• Computer Assisted Instruction for the Handicapped • p-System Basics • Debugging in LOGO • The Dow-4 Gazelle Flight Simulator • Note Whiz and Pitch Master Musical Game Reviews • Learning With the PLATO Computer Library • Strategies for Adventure Gaming • Death Drones • Using the Line-By-Line Assembler • Close Encounters of the Simon Kind • Electrical Engineering Education Program • Interview With an Arcade Game Designer • TI Invaders • Programming With Pascal • Cyber-Dice • News and Happenings in the Home Computer World • Arcade Game Reviews • The Thief Adventure Game • Programming Tips • and much, much more.

FEBRUARY 1983 (Partial Contents)
• Texas Instruments at the Winter Consumer Electronics Show • Home Computer Printers on Review • How to Create Math Daisies in LOGO • Vectors in LOGO • ASPIC: A Language for Teachers • The Joys of Adventuring—Part 2 • Programming Pointers with Chuck-A-Luck—Part 4 • Interview With the Voice of Parsec • Why You Need a Printer for Your Home Computer • Lifeline to Titan Space Game • Night Blockade Battleship Game • Tower of Hanoi Pocket Program • Computer Gaming Software Reviews • News of Late Developments in the World of Home Computers • and much, much, more.

MARCH 1983 (Partial Contents)
• An Introduction to the TI-99/2 Basic Computer • The Hex-bus and the 4/A Connection • Making Your Own Say and Spell Game • Disabled Children Learn and Grow • Super Cataloger—A Review of a Disk Library Utility Program • TI's New CC-40 Compact Computer • Robots and Their Social Impact • Twenty Questions With Robot Redford • The Gravity of LOGO • Joystick Jockey—An Overview of Remote Controllers • Parsec Strategy • Converting Extended BASIC to Assembly Language • Matrix Muncher • Mini Memory Disassembler Utility • Pulling the Shade on Sprites • Letters on LOGO • Tiny Tutorials • Games programs, reviews, and much, much more.

APRIL 1983 (Partial Contents)
• Computer Assisted Savings Planning to Build Your Nest Egg • Tex-Cipher Writes and Decodes Secret Messages • Crossbytes—Computer Vocabulary Crossword Puzzle • Cutting Corners On Your Food Budget Using Coupons • Introducing Financial Planning with Multiplan • The Design Philosophy of the Compact Computer • LOGO Takes On the Popular Fifteen Puzzle • Super Language—Programming Sprites in Mini Memory • Colorful Word World—Reading Readiness for Pre-schoolers • Gameware Buffet's A-Maze-ing Boa Alley Game • Giant and Dwarfs Entrapment Game • Game Reviews • Programming Tips • Money Saving Hints • and much, much more.

May 1983 (Partial Contents)
• A Word Processor Consumers Guide • Word Processing Software Selecting Strategies • A Generalized Filing Program for VIPs • The Multiplan Medium Balances Your Checkbook and Budget • Activity Accountant Helps School Secretaries with Extracurricular Activities • Maximizing Your Mini Memory's 4K of RAM • Exploring Enhanced BASIC • The LOGO Tortoise Debates the BASIC Hare • A Pocket Program to Organize Data with Linked Lists • Mentally Handicapped Learners Team Up with the TI-99/4A • Drive For Diskettes Presents the Wonders of Diskette Storage • Beeline—a Multi-screen Strategy Game • Lost Ruins—an Archeological Dig Game • 3-D Illusions with Sprites in Depth • Game reviews, Group Grapevine, and more, much, much more.

June 1983 (Partial Contents)
• Children and Computers Make the 99/4H Connection • Tune Your Guitar with Our TI Tuning Fork • Talk to Your Computer—Voice Technology Is Here • Gameware Buffet's Eat or Be Eaten Aardvark Game • Protect Your Station in the Space Zapper Game • What Multiplan Can and Can't Do • Understanding Inputs and Outputs in Drive For Diskettes—Part 2 • Calculate Loan Schedules on the CC-40 • Go on a LOGO Vacation • Letters on LOGO • A Review of Upper Room Software's Programs for Special Learners • Construct an RS232/Joystick Interface • Group Grapevine • Shopping Bus • A Natural Language Interface for the Professional • Game Reviews • and much, much more.

99'er
HOME COMPUTER
The Evolution of Home Computer Graphics
PROGRAM

July 1983 (Partial Contents)
• The Evolution of Home Computer Graphics Comes Alive in Graphics Grows Up • Five Data Organizers in Never Out of Sorts • TI & 99'er at the Consumer Electronics Show • WarGames: The Movie and the Book • Editing with Multiplan • The LOGO Logician Presents To Model Is to Learn • LOGO Mosaic Designs Fill the Screen • Your Speech Synthesizer as a Spelling and Foreign Language Teacher • Software for Your Low-cost Printer Port • Gameware Buffet's Treasure Island and the Colorful Switch-A-Row • A Book Review of Learn BASIC for CC-40 Users • 3-D Animation with the TMS 9918A Video Chip • Games Reviews • Group Grapevine • and much, much more.

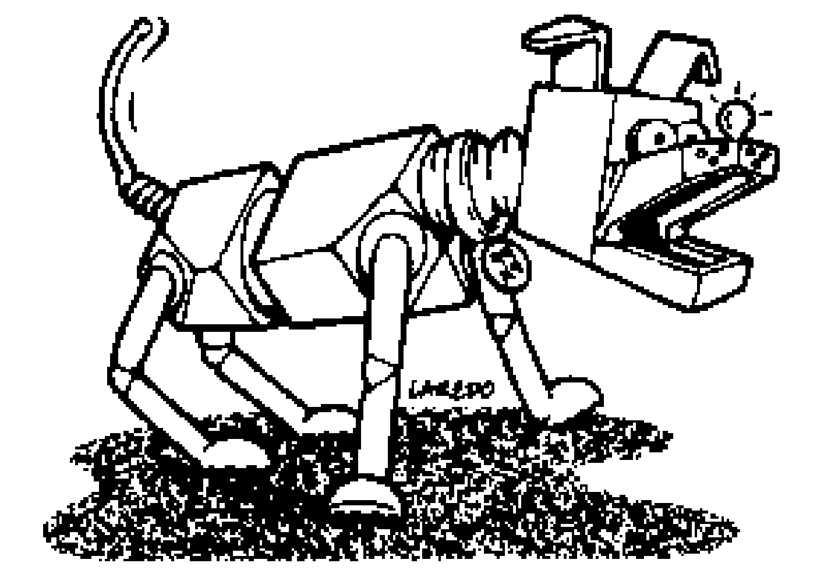
Persuasion . . . from p. 63

```
1310 RESTORE
1320 FOR BAR=1 TO 4
1330 CLMN=7*BAR
1340 READ VOTE,PERCENT
1350 REM RESERVED TO READ FILES
1360 REM RESERVED TO MANIPULATE DAT
A
1370 BARHEIGHT=VOTE/SCALE
1380 YY=INT(BARHEIGHT)
1390 REMAINDER=BARHEIGHT-INT(BARHEI
GHT)
1400 TOPPATTERN=1+INT((REMAINDER*8)
+.5)
1410 IF YY=0 THEN 1660
1420 IF YY>19 THEN 1430 ELSE 1550
1430 Z=YY-20
1440 YY=21
1450 GOSUB 2520
1460 YY=Z
1470 LABEL$="SCALE"
1480 ROW=2
1490 GOSUB 2480
1500 LABEL$="OFF"
1510 ROW=1
1520 CLMN=CLMN+1
1530 GOSUB 2480
1540 IF Z>1 THEN 1550 ELSE 1560
1550 GOSUB 2520
1560 POSITION=2*TOPPATTERN+17
1570 BARHEAD$=SEG$(MASTER1$,POSITIO
N,16)
1580 CALL CHAR(107+BAR*B,BARHEAD$)
1590 BARHEAD$=SEG$(MASTER2$,POSITIO
N,16)
1600 CALL CHAR(10B+BAR*8,BARHEAD$)
1610 BARHEAD$=SEG$(MASTER3$,POSITIO
N,16)
1620 CALL CHAR(109+BAR*B,BARHEAD$)
1630 CALL HCHAR(21-YY,CLMN-1,107+BA
R*B)
1640 CALL HCHAR(21-YY,CLMN,10B+BAR*
B)
1650 CALL HCHAR(21-YY,CLMN+1,109+BA
R*B)
1660 POSITION=2*TOPPATTERN-1
1670 BARCAP$=SEG$(MASTER1$,POSITION
,16)
1680 CALL CHAR(107+BAR,BARCAP$)
1690 CALL HCHAR(20-YY,CLMN-1,107+BA
R,3)
1700 IF TOPPATTERN<>B THEN 1750
1710 CALL CHAR(107+BAR*B,"FFFFFFFF
FFFFFC0")
1720 CALL CHAR(10B+BAR*B,"FFFFFFFFF
FFFFF00")
1730 CALL CHAR(109+BAR*8,"FFFFFFFFF
FFFFF03")
1740 GOTO 1810
1750 IF TOPPATTERN<>9 THEN 1B70
1760 IF YY=19 THEN 1B70
1770 CALL HCHAR(19-YY,CLMN-1,107,3)
1780 CALL CHAR(107+BAR*8,"FFFFFFFFF
FFFC0C0")
1790 CALL CHAR(10B+BAR*8,"FFFFFFFFF
FFF0000")
1800 CALL CHAR(109+BAR*8,"FFFFFFFFF
FFF0303")
1810 CALL HCHAR(20-YY,CLMN-1,107+BA
R*8)
1820 CALL HCHAR(20-YY,CLMN,10B+BAR*
8)
1830 CALL HCHAR(20-YY,CLMN+1,109+BA
R*8)
1840 CALL HCHAR(21-YY,CLMN-1,104+BA
R*8)
1850 CALL HCHAR(21-YY,CLMN,105+BAR*
8)
1860 CALL HCHAR(21-YY,CLMN+1,106+BA
R*8)
1870 CALL HCHAR(21,CLMN-1,97)
1880 CALL HCHAR(21,CLMN,98)
1890 CALL HCHAR(21,CLMN+1,99)
1900 LABEL$=STR$(PERCENT)&"%"
1910 IF YY<5 THEN 1920 ELSE 1940
1920 ROW=17-YY
1930 GOTO 1950
1940 ROW=19-YY/2
1950 GOSUB 2420
1960 LABEL$=STR$(VOTE)
1970 ROW=24
1980 CLMN=CLMN-2
1990 GOSUB 2470
2000 NEXT BAR
2010 LABEL$=VERTICAL1$
2020 ROW=3
2030 CLMN=3
2040 GOSUB 2470
2050 LABEL$=VERTICAL2$
2060 ROW=ROW+1
2070 CLMN=CLMN-1
2080 GOSUB 2470
2090 REM *------- TITLE BOX -------*
2100 L1=LEN(TITLELINE1$)
2110 L2=LEN(TITLELINE2$)
2120 IF L1<L2 THEN 2130 ELSE 2140
2130 L1=L2
2140 CALL VCHAR(RO,CL+L1,150,2)
2150 CALL HCHAR(RO-1,CL+L1,151)
2160 CALL HCHAR(RO-1,CL,144,L1)
2170 CALL HCHAR(RO-1,CL-1,145)
2180 CALL VCHAR(RO,CL-1,146,2)
2190 CALL HCHAR(RO,CL,32,L1)
2200 LABEL$=TITLELINE1$
2210 ROW=RO
2220 CLMN=CL
2230 GOSUB 2470
2240 REM *- IS THERE A 2ND LINE? -*
2250 IF TITLELINE2$="" THEN 2260 EL
SE 2300
2260 CALL HCHAR(RO+1,CL-1,147)
2270 CALL HCHAR(RO+1,CL,14B,L1)
2280 CALL HCHAR(RO+1,CL+L1,149)
2290 GOTO 2370
2300 CALL HCHAR(RO+1,CL,32,L1)
2310 LABEL$=TITLELINE2$
2320 ROW=RO+1
2330 GOSUB 2470
2340 CALL HCHAR(RO+2,CL-1,147)
2350 CALL HCHAR(RO+2,CL,14B,L1)
2360 CALL HCHAR(RO+2,CL+L1,149)
2370 CALL KEY(0,K,S)
2380 IF S=0 THEN 2370
2390 REM RESERVED TO CLOSE FILES
2400 END
2410 REM ***END***END***END***END**
2420 REM *-- SUBROUTINE FOR
VERTICAL LABELS --*
2430 FOR P=1 TO LEN(LABEL$)
2440 CALL HCHAR(ROW+P-1,CLMN,ASC(SE
G$(LABEL$,P,1)))
2450 NEXT P
2460 RETURN
2470 REM *- SUBROUTINE FOR
HORIZONTAL LABELS -*
2480 FOR P=1 TO LEN(LABEL$)
2490 CALL HCHAR(ROW,CLMN-1+P,ASC(SE
G$(LABEL$,P,1)))
2500 NEXT P
2510 RETURN
2520 REM *----- SUBROUTINE FOR BAR
STEMS -----*
2530 CALL VCHAR(22-YY,CLMN-1,104+BA
R*8,YY-1)
2540 CALL VCHAR(22-YY,CLMN,105+BAR*
B,YY-1)
2550 CALL VCHAR(22-YY,CLMN+1,106+BA
R*8,YY-1)
2560 RETURN
```

Purl Two . . . from p. 95

```
2760 PRINT "TIMES"
2770 RETURN
2780 PRINT "INSERT FASHION DRAPE ON
"
2790 PRINT "ROW";BR
2800 GOSUB 3430
2810 GOSUB 1570
2820 GOSUB 3460
2830 S$="      PLEASE NOTE!"
2840 GOSUB 3370
2850 PRINT
2860 PRINT "S/R INSTRUCTIONS USE BO
TH"
2870 PRINT
2880 PRINT "SIDES WHEN WORKING FASH
ION"
2890 PRINT
2900 PRINT "DRAPE."
2910 PRINT
2920 PRINT "INSTRUCTIONS FOR H/F SH
OULD"
2930 PRINT
2940 PRINT "BE APPLIED TO EACH SIDE
 ON"
2950 PRINT
2960 PRINT "ALTERNATING ROWS."
2970 GOSUB 3430
2980 GOSUB 1590
2990 GOSUB 3460
3000 S$="  SHAPING FASHION DRAPE"
3010 GOSUB 3370
3020 GOSUB 2570
3030 RETURN
3040 S$="   INPUT MEASUREMENTS"
3050 GOSUB 3370
3060 PRINT
3070 INPUT "TENSION? ":T
3080 PRINT
3090 INPUT "YARN USED? ":U$
3100 PRINT
3110 INPUT "MACHINE USED? ":M$
3120 PRINT
3130 INPUT "ROW GAUGE? ":RG
3140 PRINT
3150 INPUT "STITCH GAUGE? ":SG
3160 PRINT
3170 INPUT "WAIST + EASE? ":WA
3180 PRINT
3190 INPUT "HIP + EASE? ":HP
3200 PRINT
3210 INPUT "FLARE? ":FL
3220 PRINT
3230 INPUT "LENGTH? ":LN
3240 PRINT
3250 INPUT "HIP LOCATION? ":HL
3260 PRINT
3270 INPUT "DEPTH OF HEM? ":HM
3280 PRINT
3290 INPUT "DEPTH OF BAND? ":BA
3300 PRINT
3310 INPUT "NO OF PANELS DESIRED? "
:PA
3320 IF FL<1 THEN 3350
3330 IF PA<2 THEN 3350
3340 IF WA>HP THEN 3350 ELSE 3360
3350 GOTO 1410
3360 RETURN
3370 CALL CLEAR
3380 PRINT TAB(6);"* * * * * * * *
*"
3390 PRINT
3400 PRINT S$
3410 PRINT
3420 RETURN
3430 PRINT
3440 PRINT TAB(6);"* * * * * * * *
*"
3450 RETURN
3460 PRINT "CONTINUE?"
3470 CALL KEY(3,KEY,STATUS)
3480 IF STATUS=0 THEN 3470
3490 IF KEY=78 THEN 1280
3500 RETURN
```

June's Choice



Our readers have spoken. The winner of the June B.A.R.C. Back competition is Samuel Pincus for his article, *Drive for Diskettes, Part 2.* Our hearty congratulations and a $100 prize go to Mr. Pincus.

Index to Advertisers

A/D Electronics 11
AMS Distributors 92
Alpha Software 81
American Software Design & Distribution Co. 67
Arcade Design 55
Arro-Soft Systems 46
Bach Company, The 90
Bandin, Robert J. 94
BeeJay Funware 67
Best Software 38
Bit Byte Bit Software 39
Bizware, Inc 78
Brosis 42
C.A.Root Associates 26
C. P. R. 28
Casas Adobes Software 46
Challenger Software International 15
Cintronics 88
Complete Software 94
CompuTech Distributing 24, 25
Computer Connection I 39
Computer-Ed 17
Computer Peripherals Unlimited 17
Computertronics 48
Control Data Corporation 75
Cumberland Technology 44
D&B Software 94
DEJ Software 48
Danlen Enterprises 47
Datart Software 18
Data/Ware Development, Inc 53
Decision-Making Systems, Ltd. 62
DEMCO 45
Digital Audio 16
Dollard, Walter J. 77
Doryt Systems, Inc 89
Dow, John T. 38, 80
Dr. Mom's Kidware 63
Dynamic Data & Devices 60
Easyware 63
Eckhaus, M.K. 79
Elek-Tek, Inc 54
Extended Software Co. 23
Formorall 81
Fosco Systems Inc 94
Foundation 51
Fox Valley Software 13
Futura Software 87
Gem Software 42
Gilkes, Lolita Walker 38
Gold Coast Avionics 54
Gyles, C. 95
HSK 45
Harvey, James 47
Henderson, Charles S. 71
Homecare Software 79
Instrumental Software Systems, Inc 71
Intellestar 61
Intellitec Computer Systems 80
Intelpro 62
J & K H Software 45
JMR Associates 45
Kaleidoscope Programs 50
Leading Edge Products, Inc. 2
Machine Shoppe Software 48
Micro-Ed, Inc 79
Micro-Melamed Software 44
Micronova 99 54
Micros'Ink 50
Micro-80 Inc. 41
Midwest Technical Assoc., Inc 80
Millers Graphics 49
Minerva Communication Centre Limited 13
Mirage Software 81
Moonbeam Software 35
Morning Star Software 40
Myarc, Inc. 56
Navarone Industries 67
Norton Software 10
Not-Polyoptics 21
Oak Tree Systems 42
Parallel Systems, Inc. 60
Pegasus Software 39
Pentacle Software 39
Pewterware 37
Programs Software 71
Prometheus Software 55
Realware 17
Republic Software 72
Right Ideas 60
Ruth Co., M.W. 16
SA2 Software 50
Shenango Enterprises 50
SOFT-TEX 71
Software Carousel 93
Software Support 82
Specialty Services 50
Spectrum Software 66
Star Design Systems 42
Star Micronics 103
Sunrise Software 95
Tachyon Systems 38
TENEX 43
Texas Instruments, Inc. 12, 102, 104
Texas Software Design 55
Tex-Comp Users Supply Division 85
Textiger 45
TEXware Associates 44, 63
THinc 84
TImagination 28, 31
Titan Software 84
Tracksmith 48
Ultracomp Systems 3
Unisource Electronics, Inc. 46
Upper Room, The 57
VID-COM 57
W.O.R.D. 47
Welcom Software 56
Western Micro Systems 81
Wycove Systems Limited 62
York 10 Computerware 90
99/4(A) Program Exchange 20
99'er Bookstore 52
99'er Home Computer Magazine 96, 97
99'er-ware 36, 100, 101

99'er Buyers Guide*
Bach Company, The 52-G, 52-H
Canadian Micro Works 52-B
Compro Systems 52-B
Data Soft, Inc 52-H
David's, K. A. 52-B
Dhein's True Value 52-E
Elek-Tek, Inc. 52-C
Keystone Distributing Co. 52-A
Luv-Tronics 52-H
Microcomputers Corp. 52-G
S.A.V.E. 52-G
Tex-Comp Users Supply Division 52-D
Unisource Electronics, Inc. 52-H
99'er Home Computer Magazine 52-F

*99'er Buyers Guide found only in subscription copies.

Success Formula . . . from p. 50

```
390 PRINT #1:S$(11),S$(12),"",S$(1
    4),S$(15),S$(16),S$(17),S$(18)
    ,S$(19),S$(20),S$(21)
400 CLOSE #1
410 DATA COED DORM,JOIN STUDY GROU
    P,FINALS,BEAUTY CONTEST,STRAIT
     A'S
420 DATA NEWSPAPER INTERVEIW,MAKE
    THE TEAM,HONOR SOCIETY,FOOTBAL
    L DRAFT,JOB OFFER
430 DATA R&D,FOLLOW S.O.P.,BECOME
    QA MANAGER,SELL INVENTION,WRIT
    E ARTICLE
440 DATA GIVE LECTURE,INVEST IN "F
    UEL PILLS",RESEARCH GRANT,BLOW
     UP LABORATORY,PROMOTION
450 DATA MAILROOM JOB,FOLLOW S.O.P
    .,BOSS LIKES YOU,BECOME TREASU
    RER
460 DATA BONUS TIME,NEW SECRETARY,
    FOLLOW S.O.P.,MISSPELL BOSS'S
    NAME,CANNED,PROMOTION
470 DATA FIRST DAY,OPEN HOUSE,SUBS
    TITUTE,SABBATICAL,USE TI LOGO
480 DATA TAKE A FIELD TRIP,VACATIO
    N,GRADUATION
490 DATA CLASSROOM RIOTS,NEW JOB
500 DATA CONVENTION,PRIMARIES,THE
    POLLS,TV DEBATE,ACCEPT A GIFT,
    MAKE "CONTACTS"
510 DATA CAUGHT BY ABSCAM,SENATE A
    POINTMENT,LOSE ELECTION,LANDSL
    IDE
520 DATA SPRING TRAINING,GOLF TOUR
    NEMENT,TV INTERVIEW,PLAY WIMBL
    EDON
530 DATA ENTER PLAY-OFFS,YOUR THE
    MVP,FORGOT TRUNKS,OUT TOO LATE
    ,BLITZED,FREE AGENT
540 DATA HS,BA DEGREE,BS DEGREE,MA
     DEGREE,MS DEGREE
550 DATA TAXES,NEW CAR,COURT,HOSPI
    TALIZED,COLLEGE,INFLATION,BUSI
    NESS,HOBBY,TEACHING
560 DATA UNEMPLOYMENT,POLITICS,REN
    T,,SHOPPING,HAWAII
570 DATA VEGAS,SPORTS,PARIS,SCIENC
    E,CHARITY,DOUBLE PAY
```

WRITERS OF FICTION:

99'er Home Computer Magazine will start publishing "technological" fiction. We are searching for unique short stories (up to 3000 words) that are centered around computers, robotics, and related technologies. Manuscripts should be sent to:

Fiction Department
99'er Home Computer Magazine
1500 Valley River Drive
Suite 250
Eugene, Oregon 97401

99'er.WARE™

P.O. Box 5537
Eugene, Oregon 97405
Tel. (503) 485-8796

ALL 99'er-ware PRODUCTS ON THIS PAGE MAY BE ORDERED
USING THE BIND-IN CARDS NEAR THE REAR OF THIS MAGAZINE

Keep Your Magazines & Tapes Together

With a FINDER-99'er-BINDER™

—Only $11.95

(magazines and tapes not included)

- Big enough to hold 6 magazines and 12 tapes
- Uses wire straps to hold magazines so that no hole punching is necessary
- Attractive and Durable

FREE 99'er Master Index with each 99'er Finder-Binder order (will be mailed when available in 3rd Quarter, 1983).

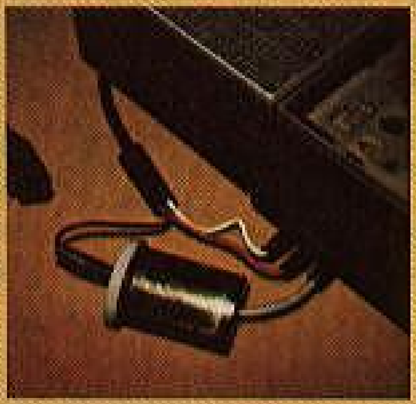
**Only $11.95 without cassettes, plus $3.00 shipping & handling. 6 High-Quality 99'er-ware C-10 Digital Computer Cassettes (with special BASE tape and 5-screw housing for data integrity). Available separately for $7.00 plus $2.00 shipping & handling.*

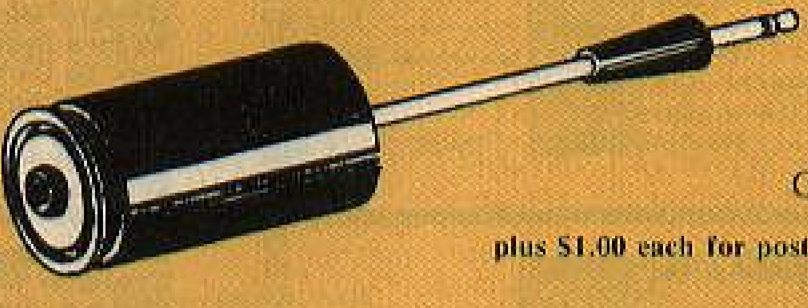
SPECIAL: 99'er Finder-Binder that is packed:
- **with 6 of the above blank cassettes for only $16.95**
- **with 12 of the above blank cassettes for only $21.95**

Add $4.00 shipping & handling to either order.

If The TI-99/4A Will Not Control Your Cassette Recorder Through Its Remote Jack, We Have The Solution For You . . .

The TEX-SETTE™ Adapter



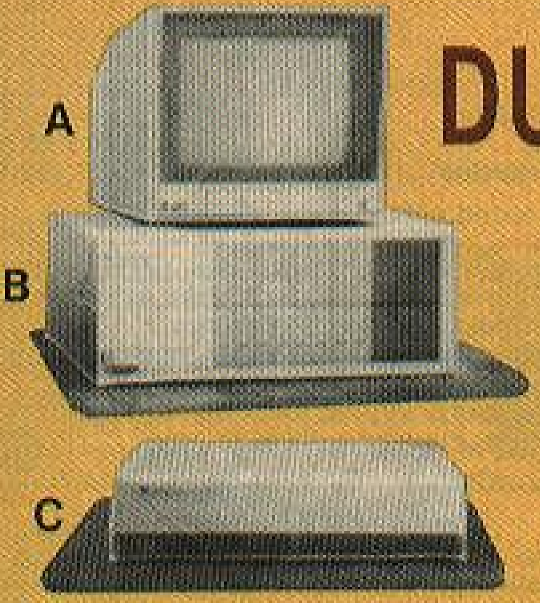


Low cost

Only **$5.95**

plus $1.00 each for postage and handling.

Cassette Compatibility At Last!

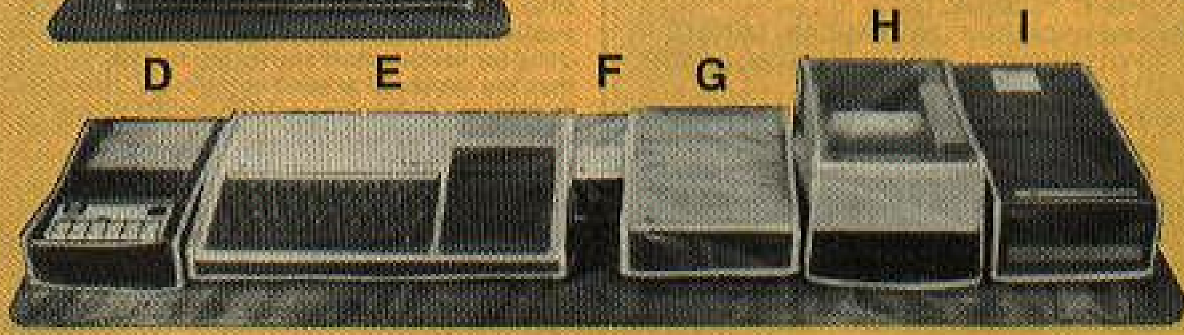


DUST COVERS

Features:

- Equipment Protection
- Handsome Appearance
- Custom-Fit
- Antistatic Treated
- Quality Construction

A	10" Color Monitor Cover	$10.95
	13" Color Monitor Cover (now shown)	$12.95
B	Peripheral Expansion Box Cover	$12.95
C	TI's 99/4 Matrix Printer Cover (same as Epson MX-80 Cover)	$9.95
D	Cassette Recorder Cover (1 size fits up to 10" x 6")	$4.95
E	TI-99/4(A) Console Cover	$8.95
F	Speech Synthesizer Cover	$3.95
G	Peripheral box Cover (Specify: 32K Memory Expansion, RS232 Interface, or Disk Controller)	$5.95
H	Thermal Printer Cover	$8.95
I	Disk Memory Drive Cover	$5.95

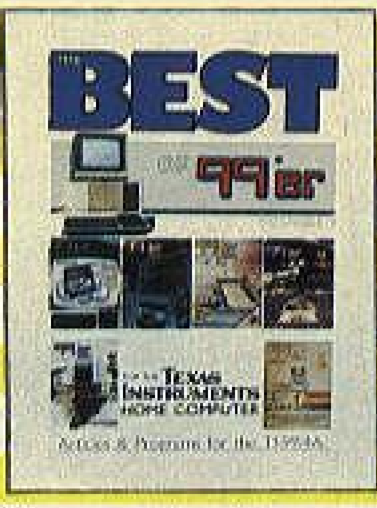


DEALER
INQUIRIES
INVITED

Add $2.00 shipping/handling for the first dustcover; 50 cents for each additional cover.

99'er-GUIDE™ BOOKS

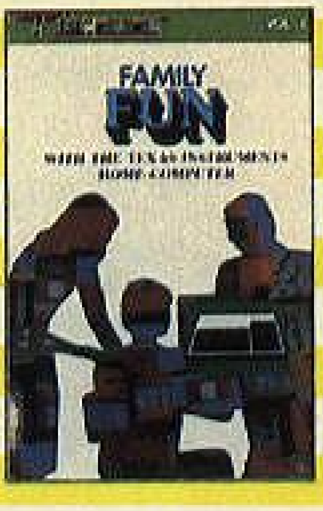
COMING SOON TO YOUR FAVORITE DEALER OR BOOKSELLER



THE BEST OF 99'er
for the TEXAS INSTRUMENTS HOME COMPUTER
Articles & Programs for the TI-99/4A

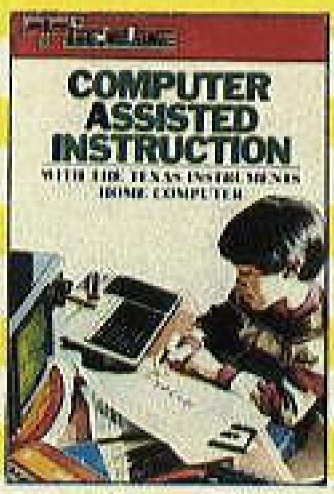
This giant compendium of material drawn from the first publication year of *99'er Magazine* (original name) contains nearly 400 magazine-size pages chock full of valuable tips, tutorials, applications and "How-To" articles, plus 75 type-in-and-RUN computer programs in four languages (BASIC, Extended BASIC, LOGO, and Assembly) for the TI-99/4A Home Computer. The information, programming and attractive artwork contained within this first compendium have been completely revised and updated from the material as originally published. The collection also contains some new material never before published. This mammoth reference work is organized into eight comprehensive chapters—the first dealing with "Starting Out"; the next four with languages and programming; and the remaining three covering computer-assisted instruction, game-playing, plus applications and utilities. $19.95

paperback, 8½ x 11, 376 pages + color plates



This newly-revised and updated selection of material drawn from the first two years of *99'er Home Computer Magazine* introduces families to the myriad of entertainment possibilities with their Texas Instruments 99/4A Home Computers. Fresh artwork and careful organization of the material make computer literacy both fun and easily attainable for family members of all ages. Neophytes will learn how to program sound effects and graphics and design their own games. Additionally, there are six complete game programs ready to be typed in and played. A unique "Programmer's Guide" appendix transforms this volume into a powerful learning tool for those who desire to go deeper into various aspects of programming.

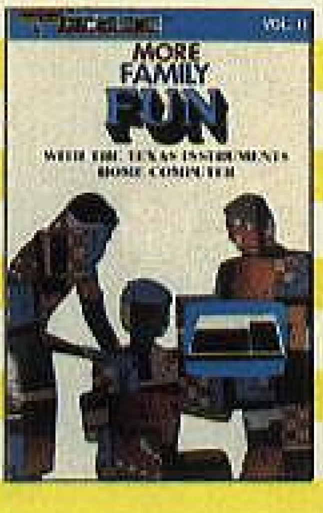
paperback, 128 pages; 5½ x 8½ $5.95



99'er GUIDE
COMPUTER ASSISTED INSTRUCTION
WITH THE TEXAS INSTRUMENTS HOME COMPUTER

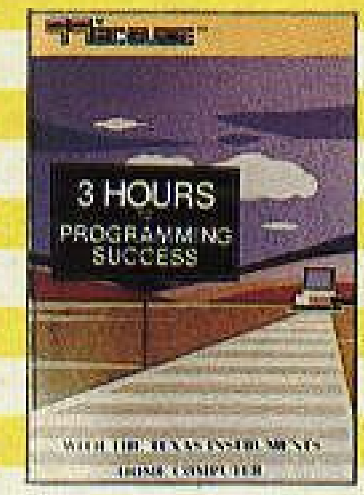
This newly-revised and updated selection of material drawn from the first two years of *99'er Home Computer Magazine* brings together in one handy volume a wealth of material for all those interested in the educational use of the Texas Instruments Home Computer. Readers are exposed to the exciting world of Computer-Assisted Instruction (CAI) where the TI-99/4A Home Computer serves as tutor, mentor, and ever-patient helper performing tasks that range from guiding preschool children in drawing block letters to using the extensive PLATO library. The book also contains ten complete CAI programs that are ready to be typed in and used. Included in this batch is the entire program listing, syntax, and user's guide to the ASPIC language—a LOGO-like language specifically designed for teaching purposes, that is itself written in TI BASIC. A unique "Programmer's Guide" appendix (see *Family Fun* books) is included. $5.95

paperback, 128 pages; 5½ x 8½



This is the ideal companion to Volume 1 in the *Family Fun* series. It takes up where the first book leaves off—more tips, tutorials, attractive artwork, half a dozen game programs, plus an entertaining home bartending utility. The "Programmer's Guide" appendix adds to the learning aid material found in the first volume. $5.95

paperback, 128 pages; 5½ x 8½



99'er GUIDE
3 HOURS TO PROGRAMMING SUCCESS
WITH THE TEXAS INSTRUMENTS HOME COMPUTER

This book is the cure for "cyberphobia" (the fear of computers and computer-related activities) in new owners of the Texas Instruments Home Computer. After using "canned" software in the form of video game modules, home financial packages, and educational programs, most people become curious about computer programming. They want to know how to make screen graphics, generate computer music, and produce special color effects. When they try on their own, they often have problems with BASIC communications. This friendly 99'er-Guide™ sweeps away the mystery and quickly shows new TI owners of all ages how to get single programs up and RUNing as fast as possible. After completing this entertaining 3-hour course, the reader will be pleasantly surprised to find that the computer has become a friend as well as a useful tool. Complete with comprehensive glossary, reference charts, and attractive illustrations throughout.

paperback, 128 pages; 5½ x 8½ $5.95

99'er magazine™ ON TAPE

Selected Programs From This Publication Are Now Available on Cassette Tape

- All purchasers of these packages are responsible for obtaining the individual documentation and program instructions in the indicated back issues of the magazine. When an issue goes out of print, copies of the program articles will be made available for purchase.
- If programs have been updated/enhanced since original publication, a printed copy of documentation changes will be provided with the tapes.
- Both subscriber & non-subscriber prices are indicated. To be eligible for the lower subscriber prices, you must be a current, paid magazine subscriber. All orders will be verified prior to shipment.
- Authors of these and future programs distributed on tape and disk will receive **Bonus Payments** based on the number of tapes sold; in fairness to them, please observe the Copyright laws, and report any incidents of "piracy" to our office.
- Recognized TI User Groups should contact us for special bulk terms & rates ---- No dealers, please.

Note: Programs in this issue will be available on a future tape release.

Use the bind-in card in the back of the magazine for your convenience in ordering.

Shipping—$1.00 for 1st tape, 50 cents each additional. Foreign Orders Shipped Airmail—$3.00 for 1st tape, 75 cents each additional.

PACKAGE #M2/5
From Vol. 2, No. 6
and Vol. 2, No. 7

Giant & Dwarfs (Extended BASIC)
Box Alley (TI BASIC)
Word World (Extended BASIC)
Lost Ruins (TI BASIC)
Beeline (Extended BASIC)
M/M Relocator (TI BASIC w/Mini Memory)

$12/sub; $20/non-sub

PACKAGE #M2/2
From Vol. 2, No. 2

Termite (TI BASIC)
Tex-Scribe (Extended BASIC)
Gold Rush (Extended BASIC)
Plotting Routines (Assembly Object Code for Mini Memory Loader)

$12/sub; $20/non-sub

PACKAGE #M2/4
From Vol. 2, No. 4
and Vol. 2, No. 5

Lifeline to Titan (Extended BASIC)
Night Blockade (TI BASIC)
Quintus (TI BASIC)
Space Junket (Extended BASIC)
M/M Disassembler (TI BASIC w/Mini Memory)
Say & Spell (Extended BASIC)

$12/sub; $20/non-sub

PACKAGE #M2/1
From Vol. 2, No. 1

Up Scope (Extended BASIC)
Micro Jaws (Extended BASIC)
Knight's Tour (TI BASIC)
Screen Dump (Assembly Object Code for Mini Memory Loader)
ASPIC (TI BASIC)

$12/sub; $20/non-sub

PACKAGE #M2/3
From Vol. 2, No. 3

Close Encounters of the Simon Kind (TI BASIC)
Learning the Alphabet (TI BASIC)
Cyber-Dice (Extended BASIC)
Electrical Engineering Resistance (TI BASIC)

$12/sub; $20/non-sub

PACKAGE #M1/6
From Vol. 1, No. 6

Verbose (TI BASIC with Speech)
Color Mapping (TI BASIC)
County Fair Derby (TI BASIC)
Battle Star (Extended BASIC)
N-VADER (Extended BASIC)
Pre-School Block Letters (TI BASIC)

$12/sub; $20/non-sub

TI's Home Computer Software. The best way to bring the classroom home.

Keep the whole family learning with the Texas Instruments 99/4A Home Computer. Our library of exciting educational software programs goes from preschool through college and beyond. And no one offers a better educational software selection for traditional subjects or computer literacy.

Every subject in our library has been carefully developed with the help of leading educators: Scott, Foresman; Addison Wesley; Milliken; DLM; Scholastic; MECC and others. Many of their programs use synthesized speech to enhance learning.

And only the TI Home Computer has PLATO™ Basic Skills and High School Skills courseware. Until recently, only found in schools, PLATO teaches math, reading, social studies, grammar, science —more than 108 essential courses designed to give your kids an edge in education at home.

You can even teach yourself to write your own programs for your Home Computer, using any of six available languages: TI BASIC, TI Extended BASIC, TI LOGO, UCSD Pascal;* TI PILOT and TMS 9900 Assembly language.

If it's an education you want from your computer, the computer you want is from Texas Instruments.

For more information about our educational software or our broad selection of other software applications, call toll free: (800) 858-4565.

Creating useful products
and services for you.

TEXAS
INSTRUMENTS

Copyright © 1983 Texas Instruments.

PLATO is a trademark of Control Data Corporation, U.S.A. Copyright © 1982, Control Data Corporation. All rights reserved. PLATO courseware is manufactured under license to Texas Instruments Incorporated.

*UCSD Pascal is a trademark of the Regents of the University of California.

When it comes to superior performance, we study our lines very carefully.

Superior printer performance is not a fluke. It evolves from analyzing printed line after printed line. Taking the time to test and retest. After 30 years of manufacturing precision parts, we know that there are no shortcuts.

And so we took the Gemini-10X and methodically put it through its 120 cps pace. We achieved a print head life of over 100 million characters with an extremely precise dot alignment creating each crisp character.

So far so good.

Next, sophisticated performance demanded versatility. A wide choice of character sets, a buffer expandable to 8K, and the ability to interface with all popular personal computers. We added macro instruction, giving Gemini-10X the capability to perform up to 16 operations with one command. We included as standard a paper feed system that has a friction and fully adjustable tractor feed. Then we even built in the dexterity to print graphics and text on the same line.

Done.

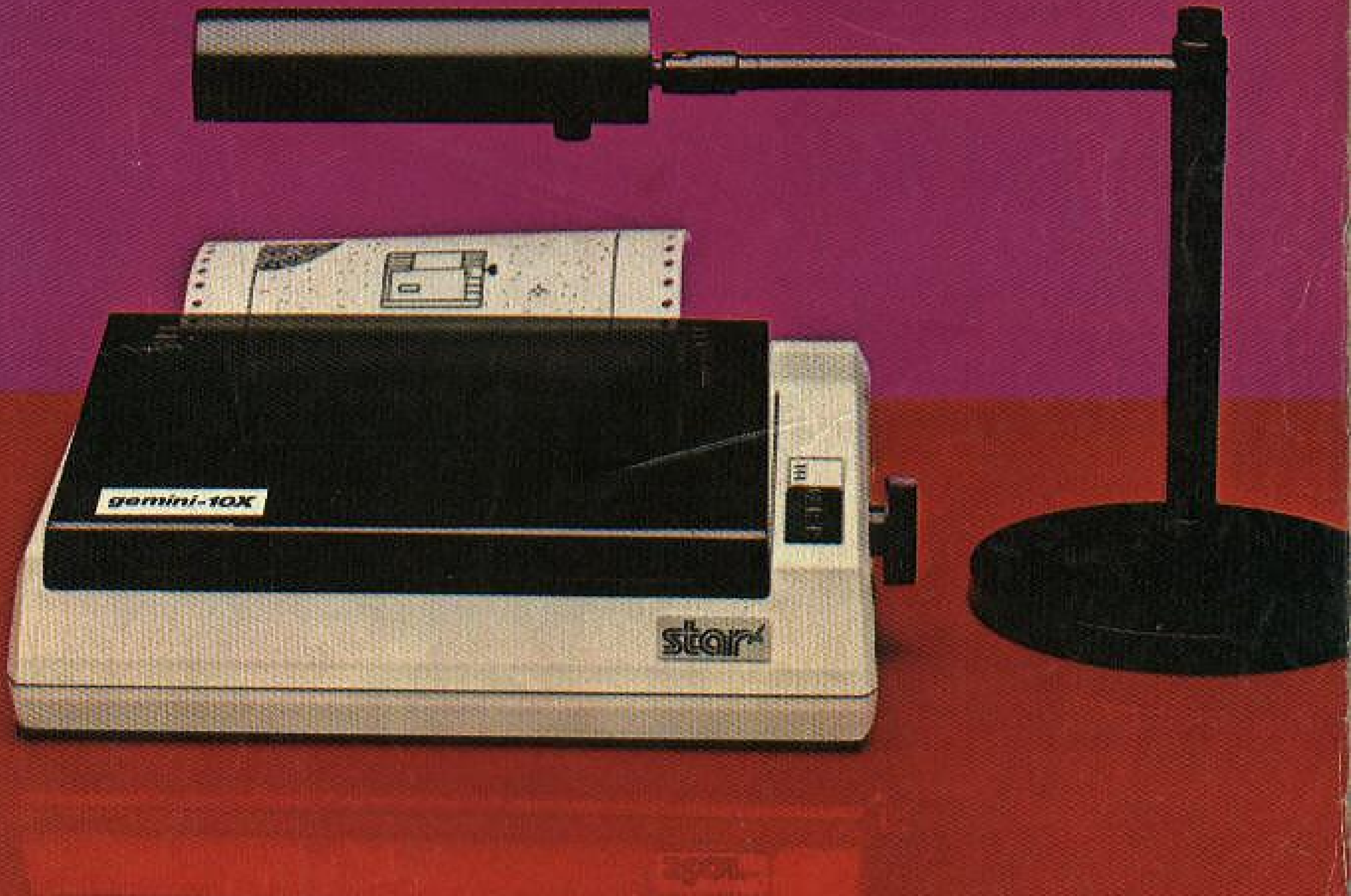
And, of course, staying the best means constant reviewing and fine-tuning. Keeping the Gemini easy to find, easy to afford and so reliable it can be warranted for up to twice as long as its major competitors.

Only the most careful engineering has built the new hard-working Gemini-10X. You'll applaud its performance.

star™
micronics · inc

THE POWER BEHIND THE PRINTED WORD.

Computer Peripherals Division
2803 N.W. 12th Street, Dallas/Ft. Worth Airport, TX 75261



TI LOGO: It opened a door they thought was locked.

It opened a door to their minds.

The key: a Texas Instruments Learning Computer and TI LOGO, a programming language developed by TI and MIT.

In his inner-city, New York junior high classroom, teacher Steve Siegelbaum explains why it works so well.

"When they use it, they think they're teaching the machine. In reality, it's teaching them how to learn. It definitely improves their attitude toward their other courses. Written and verbal expression improve–they're eager to show you, to tell you, what they've done."

Another teacher, Pete Rentof, adds, "What it fights is fear of failure – a mistake becomes a starting point. The whole learning process turns into a positive experience. It works."

The TI Learning Computer, with TI LOGO and many other educational programs, is equipped to help open doors in any classroom. Including yours. For information on this remarkable system, contact: Texas Instruments Customer Relations, P.O. Box 53 Lubbock, Texas 79408.

TEXAS INSTRUMENTS

© 1982 Texas Instruments